

# COMPUTERWORLD

WIN THE CASE!  
The Global 100

## Vaporware tactics elicit mixed views

By Stuart J. Johnston

Vaporware, software announced long before its delivery, does not appear to be hazardous to user health, according to an exclusive *Computerworld* survey.

The survey of 100 information systems professionals last week revealed that 80% of those polled said preannouncements of product plans are useful for decision-making purposes. Yet 69% agreed that such early information from major vendors such as IBM and Microsoft Corp. can have a market-freezing effect for smaller competitors (see chart, page 147).

And while federal Judge Stanley Sporkin last made a major issue about vaporware from Microsoft, which he contends has a harmful effect on the market, users don't seem to care.

"The earlier I know [what's coming], the better, but we still buy for today's needs knowing that things will change tomorrow," said Jerry Clement, a staff technician in the legal technical document group at United Airlines in South San Francisco.

However, users are absolutely more interested in near-term product deliveries than faraway ones. Fully 91% of those surveyed preferred to hear about product features and functions that will be

Vaporware, page 147

## Reality check

Full benefit of Plug and Play technology is two years away

By Jaikumar Vijayan and Michael Fitzgerald

Plug and Play — one of the most highly anticipated features of Windows 95 — will be more promise than reality when the operating system ships later this year, several vendors, including Microsoft Corp., confirmed last week.

Older or legacy PCs will be unable to take full advantage of Plug and Play, which is supposed to give users hassle-free, automatic peripheral device detection and configuration. And corporate users will face a comprehensive overhaul or upgrade of their existing systems in order to use it.

There is "going to be a disconnect between people's pie-in-the-sky expectations for Plug and Play" and reality, said Scott Stetler, a product manager at Adaptec, Inc., a leading manufacturer of SCSI devices in Milpitas, Calif.

In fact, it could be at least two years before

Windows 95 users can count on full Plug and Play capabilities with any device or peripheral they buy.

Several users contacted last week were not up in arms about the problem but said it was a concern.

"The Plug and Play feature is a real advantage for Windows 95, [and it] certainly would be viewed as a downside if a card didn't work with the spec," said Glenn Jurman, a technical specialist at Baxter

Healthcare Corp. in Deerfield, Ill. Still, Jurman said that while "Plug and Play would make life a lot easier," other issues with Windows 95 were more significant to Baxter.

Even users with Intel Corp. Pentium-based systems will get full Plug and Play capabilities

Plug and Play, page 14

Do you rely on pre-announcements from major software and hardware providers to help plan future technology decisions?



## IS taps temp execs

By Julia King

Are you an experienced information systems executive who has been re-engineered out of a job years before you planned to retire?

Does the idea of earning \$125 an hour working exclusively on high-level strategic IS projects appeal to you?

If you answered yes to either question, you may want to consider hiring yourself out as an interim IS executive. A growing number of companies are looking to rent — rather than permanently employ — experienced, executive-level IS professionals.

The current \$1 billion U.S. market for temporary technical executives, page 15

### Timely techies

High-tech executives account for roughly 20% of all temporary workers placed by recruiting firms, according to Kennedy Publications. And the \$1 billion market for temp executives is growing by 25% annually.

### Distributed computing

## IBM/Cisco deal to ease legacy moves

By Michael Fitzgerald and Laura DiIorio

In a major advance for IBM mainframe users, Cisco Systems, Inc. will announce in mid-May that it is embedding IBM's Advanced Peer-to-Peer Networking functionality into all of Cisco's routers, sources said last week.

Cisco support for APPN will aid large corporations trying to migrate from the legacy SNA environment to client/server platforms.

APPN, in conjunction with the LU6.2 networking protocol, is IBM's avenue for connecting SNA systems and LANs. By putting APPN support into Cisco's market-leading routers, IBM is effectively giving SNA users a kind of universal language for distributed computing.

### Works for users

IBM and Cisco officials declined to comment on the announcement. But users gave news of the move an initial thumbs-up.

"Depending on how they integrate it with [IBM's] NetView product so you gain the ability to view the total network, that could come in

IBM/Cisco, page 16



## Client/server software heads for MVS territory

By Rosemary Caluso

IBM's MVS operating system is one old dog that's about to learn some new client/server tricks.

Strange as it may seem, the venerable mainframe operating system is poised to become a key client/server applications platform.

Users and analysts last week attributed the increasing MVS activity to the maturing of the client/server industry.

Some information systems executives also cited a desire to leverage their hardware and software investments, in addition to acknowledging lingering doubts

MVS, page 147



So, how was it?



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**LEGEND**



## It was a very good day. Nobody yelled at you.

Someone asked your opinion on a business problem, and you had the time to answer. An end user thanked you. You tinkered with a new software package. Only one server went down. You took a spin on the Infobahn. The CEO came back from camp, hit you with some buzzwords, and you told him you already had those things implemented. All in all, it's pretty amazing what good systems management software can do for your day. And at Legent, we've put together the most extensive set of industrial-strength, distributed systems management tools available. Thanks to our XPE™ strategy, our software can work together across almost anything you can wire together, too. Regardless of function or platform, from PC LANs to UNIX servers to mainframes. Which means you can manage everything from the platform of your choice, something our customers say is definitely making their lives easier. Who knows where all of this could lead? You might actually start whistling in the hallway. Or at least wanting to.





"It remains why your great-grandchildren shouldn't be able to boot up your program and ... interact with you even though you've been dead for a hundred years. If you want to immortalize, digitize."

— **Therese Loevy**, *editor and author of Chaos & Cyber Culture*, discusses the information age. In **Depth**, page 117

## Log in, link up, Get off

■ It's back to court for Microsoft and the U.S. Department of Justice, which hopes to block Microsoft's purchase of **Intuit**. **NEWS**, page 2

■ A Microsoft/Computer Associates agreement to port **Unicenter** represents a C/A endorsement of **Windows NT**. **NEWS**, page 2

■ IBM will try to simplify management of distributed networks this week when it revamps its **SystemView** platform. **NEWS**, page 4

■ Novell promises products to shield users from the differences between competing object technology camps. **NEWS**, page 4

■ Informix plans to ship its entry in the work-group-level database field late this year. **NEWS**, page 6

■ The U.S. government tries to get people talking via an electronic meeting. **NEWS**, page 10

■ Workflow technology could finally find the perfect fit in client/server applications, but it will not be happening overnight. **NEWS**, page 24

■ Users anticipate using PowerPC-based Apple PowerBooks as a replacement for desktop machines. **DESKTOP COMPUTING**, page 30

■ Digital's climb in the ranks of the PC market's Top 5 may be stalling. **DESKTOP COMPUTING**, page 41

■ Firewalls have their pitfalls, according to experts who warn that relying on firewalls for Internet security can actually increase exposure to risks. **ENTERPRISE NETWORKING**, page 72

■ AS/400 users catch software price breaks on their low-end systems. **LARGE SYSTEMS**, page 83

### How do you measure up?

How does your IS department compare with the **Computerworld Premier 500**? Fill out the **Premier 500** survey, and we'll send you a free report showing how your operation compares with Premier 500 averages. Consolidated information from the surveys we collect may be published in a future Premier 500 issue. Send a request on company letterhead to Paul Gillin, Editor, **Computerworld**, 375 Condit Road, Framingham, Mass. 01901 or e-mail to [survey@cw.com](mailto:survey@cw.com).

■ **Computerworld Test Drive**: Hands-on review shows that **Borland's Delphi** is a worthy challenger to **Microsoft's Visual Basic**. **APPLICATION DEVELOPMENT**, page 89

■ What's your type? Two out of three IS managers are introverts. IS staffers like logical problem-solving more than most professionals. It's fun to match co-workers by personality type, but the real value of the **Myers-Briggs personality profile** is in building teams. **MANAGEMENT**, page 103

■ Cutbacks still plague state government IS, but a background in E-mail administration, document management and multimedia will come in handy. **CAREERS**, page 123

■ Pentium-based PCs, on average, declined \$355 in first-quarter 1995. **MARKETPLACE**, page 134

■ Paul Gillin says that despite its problems, **Windows 95** is destined for success. **VIEWPOINT**, page 38

■ Trash that classroom training budget. The best learning comes from working with people who know their stuff, says **Michael Schrage**. **VIEWPOINT**, page 37

■ The merrily lie, says **Charles Babcock**: There certainly is payback in client/server. **COMMENTARY**, page 148

## Defying the giant

It was the David vs. Goliath lawsuit that forever changed the balance of power between users and vendors. **Computerworld** revisits the landmark 1975 **CATAMORE VS. IBM** case.

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## Executive Briefing

**Companies are re-engineering the workplace with business objects:** Fidelity Investments, Federal Express, Time Warner and other pioneers are using "business objects" to model re-engineered processes and new systems.

However, difficulty of design, high monetary and time costs and difficult integration remain possible obstacles to widespread adoption. **Page 112**

**CIO for a day or a year.** Demand for temporary IS executives is on the rise. Some companies view hiring interim IS managers as a viable alternative to more expensive consulting firms. **Cover 1**

**Client/server or MVS?** You can have both. The increasing activity surrounding IBM's MVS mainframe operating system is tied to the maturing of client/server. Some users are asking their software providers to deliver MVS-based client/server applications. **Cover 1**

**New image-enabled remote workstations** give companies a chance to let production employees follow the lead of salespeople and other professionals by working at home. ISDN lines and these workstations allow telecommuting workers to process insurance claims, for example, using workflow/imaging technology. **Page 65**

**At Comdex:** The word from vendors is that the promise of Plug and Play could be some time away. **Cover 1**. MCI expands its Internet strategy with new business offerings. **Page 14**

**On the 'net:** Advertisers are wrestling with ways to market products and services on-line without inflating cyberads or chewing up gigs of bandwidth. **Page 20**. Florida takes three separate routes on the information superhighway. **Page 71**. Firewall came under fire, and 3-D goes on-line. **Page 72**

**EDS is preparing to launch outsourcing for PCs and LANs** from several worldwide support centers. In May or June, EDS will introduce Distributed System Management centers linked via a TCP/IP network to leverage the expertise of help desks and remote administrators for multiple customers. **Page 28**

## The 5th Wave by Rich Tennant



"WHAT CONCERNS ME ABOUT THE INFORMATION SUPERHIGHWAY IS THAT IT APPEARS TO BE ENTERING 'TROPICAL BREEZY BEACH'."

# Unicenter lands on Windows NT

By Thomas Hoffman and William Brandt  
ATLANTA

Comptel Associates International, Inc. and Microsoft Corp. last week took marriage vows of sorts by saying they will port CA's Unicenter system management software and applications packages to the Windows NT platform. The two companies will also jointly market the software.

The products will roll out beginning this month (see chart).

Analysis said the partnership constitutes the industry's two largest software vendors helping each other overcome their greatest weaknesses in these specific products. The deal should boost Microsoft's sales that have wondered if the desktop vendor has the right stuff for the rest of the enterprise. At the same time, the agreement helps CA in sites that are downgrading to Microsoft's NT platform and that do not necessarily think of CA as a desktop vendor.

## Mission-critical alternative

At Baxter Healthcare Corp. in McGraw Park, Ill., CA-Unicenter for Windows NT will provide "a viable alternative to running mission-critical applications on MVS or Unix," said Tony Navarro, an information technology strategist. Baxter plans to run CA-Unicenter to manage several Windows NT applications.

CA derives 15% to 15%, or \$240 million (to \$300 million), of its \$2.4 billion in annual

revenue from client/server products, according to Stephen T. McEllean, a first vice president at Merrill Lynch Global Securities in San Francisco. Most of the rest of CA's revenue comes from its traditional stronghold in mainframe software and services, with about 10% coming from desktop packages.

For CA, which is the United States' largest server strategy in the Unix space for

ing starting at \$2,000 per server, McEllean said.

The overall revenue impact for both vendors is still sketchy because CA and Microsoft officials have not yet decided on a combined pricing scheme for an integrated Unicenter package that will include Microsoft's Windows NT Server and SQL Server runtime software when it begins shipping in mid-July.

The CA/Microsoft alliance may be even more bad news for IBM's OS/2, according to Judith Harwitz, president of Harwitz Consulting Group, Inc. in Watertown, Mass. A Windows NT environment backed and marketed by a strong enterprise vendor such as CA poses a threat to OS/2 and in-ent Unix server systems, she said.

## Vertical strength

Further, CA's plans to deliver parts of its vertical applications, including those for manufacturing, human resources and accounting, will give Windows NT "credibility from a solutions point of view" — not only for CA shops, but for any and all prospective Windows NT users, DelPinto said.

CA plans to deliver Windows NT versions of these vertical applications beginning in the fall, said Yogesh Gupta, senior vice president of open systems at the Islandia, N.Y. software juggernaut.

Dina Madson, a systems support analyst at King County Medical Blue Shield in Seattle, said her organization's deci-

the past two years, the commitment to Windows NT will help propel it "out of the backwater of legacy systems ... even more than what Unix has done," said Donald A. DelPinto, a senior analyst in the software strategies service at Forrester Research, Inc. in Cambridge, Mass.

CA, which announced its alliance with Microsoft at Comdex/Spring '95 last week, has committed to delivering at least 25,000 copies of CA-Unicenter for Windows NT, with single CPU server pri-

After CA begins shipping CA-Unicenter systems management software for Windows NT this month, why would anyone need Microsoft's Systems Management Server (SMS)?

SMS was primarily designed to administer Windows NT-only desktop systems. Its strength is in software distribution and hardware and software inventory management. For its part, CA-Unicenter works across a wide variety of non-Microsoft platforms, with strengths in areas such as scheduling and console management.

"If you are an all-Microsoft site and Windows NT is your main strategic direction, then SMS will work," said Ronald G. Corriveau, president of ARC Associates, Inc., a Berlin, Mass.-based network consultant and systems integrator.

Microsoft Chairman Bill Gates, who conceded that there is some overlap between SMS and Unicenter, said the CA/Microsoft alliance will have no bearing on his company's direction with the LAN systems management package. "Users will be using [SMS] to go to client machines, gather data and feed it to Unicenter," Gates said.

—Thomas Hoffman, William Brandt and Paul Gilin

sion to install applications on Windows NT instead of on its IBM AIX Unix environment "is often [based] on the availability of application software."

Computerworld editor Paul Gilin contributed to this report.

# Microsoft, Justice dance antitrust tango again

By Miles Bettis and Stuart J. Johnston

Microsoft Corp.'s plan to buy a dominant position in the electronic banking market via the \$2 billion purchase of First Interstate, Inc. ran into the biggest snag of all: a federal antitrust lawsuit.

The U.S. Department of Justice last week filed suit to block Microsoft's planned merger with the Menlo Park, Calif.-based maker of Quicken financial software. Microsoft and Justice officials vowed to fight the suit, which typically means the case will take at least two years to resolve if it goes to trial.

The party line at Microsoft in Redmond, Wash., was that this lawsuit is just a normal — albeit disappointing — phase in the process of a bigger merger. The combative Microsoft Chief Executive Officer Bill Gates said, "Our enthusiasm for bringing Intuit and Microsoft together is very strong. We're going to go through the next phase, and we're optimistic." In solidarity, Intuit Chairman Scott Cook agreed, "We are 100% committed to this merger

with Microsoft. We are going to see this all the way through to make it happen because we believe this is good for consumers," he said.

Yet the government's complaint, filed in U.S. District Court in San Francisco, quoted Cook as telling his board of directors the deal would eliminate "a bloody share war" with "Godzilla," his code name for Microsoft.

The Justice Department is basing its case on the old-fashioned principle of dominant market share. The merger of the No. 1 and No. 2 competitors in the PC financial software category would lessen competition, raise prices and reduce innovation, the lawsuit said. The department said Quicken had a market share of 66% in 1994. Microsoft's Money package had 22%, and the rest of the pack was faltering badly.

Microsoft's play to escape antitrust problems by giving the Money package to Novell, Inc. for virtually nothing — except 10% of the royalties in the first year — was a notable failure.

"This so-called fix just won't work," Anne K. Bingaman, assistant attorney general in

The government complaint quotes Intuit Chairman Scott Cook as telling his board of directors the deal would eliminate "a bloody share war" with "Godzilla," his code name for Microsoft.

charge of the Antitrust Division, said in a statement. Furthermore, Microsoft's control of that market, on top of its dominance in desktop operating systems, would allow it to "exert control of the markets of the future, including PC-based home banking," Bingaman said.

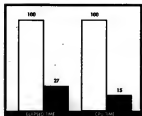
That was the argument made by numerous Microsoft competitors, including the anonymous clients of Silicon Valley attorney Gilbert Rebuck who submitted a white paper to the Justice Department to persuade the government to block the Intuit deal. "There are going to be a lot of very relieved people in Silicon Valley," Rebuck said last week.

The next step is for the Justice Department to obtain a preliminary injunction to bar the merger until the case goes to trial.



Justice's Anne Bingaman: Selling Money to Novell did not resolve antitrust issue

## PERFORMANCE



UNIX System Sort
  SyncSort

## FUNCTIONS

	UNIX System Sort	SyncSort
<b>RECORD FORMATS</b>		
Fixed length binary	NO	<b>YES</b>
Variable length binary	NO	<b>YES</b>
ASCII Text	YES	<b>YES</b>
<b>RECORD SORT OPTIONS</b>		
Selection	NO	<b>YES</b>
Refinement	NO	<b>YES</b>
Summarization	NO	<b>YES</b>
Grouping	NO	<b>YES</b>
<b>CHARACTER SETS</b>		
Standard ASCII	YES	<b>YES</b>
EBCDIC	NO	<b>YES</b>
User Defined	NO	<b>YES</b>
Multi-byte	NO	<b>YES</b>

UNIX has its advantages, but its System Sort isn't one of them.

All it can do is sort ASCII text - slowly!

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## The UNIX System Sort



XINN

## Troubleshooting

# Tivoli provides a way to check on applications

By Steve Moore and Rosemary O'Leary

Tivoli Systems, Inc. last week took what observers considered a good first shot at a killer issue for many client/server users: applications management.

The Austin, Texas, company rolled out the Applications Management Specification (AMS), and Powerwatch, a unit of Sysware, Inc., was the first company to endorse it. AMS will provide books, or application programming interfaces (APIs), to link client/server applications to Tivoli management tools.

The end result will be "management-ready" applications that essentially allow management tools to peek under the covers of software programs and monitor for problems or check that certain components are installed.

Key applications management functions	
Function	User benefit
Event monitoring	Yields important information about application performance
Software distribution	Ensures proper installation of applications on client and server systems
Dependency checking	Ensures all prerequisite software is installed on clients and servers

Currently, systems management tools can keep tabs on an operating system environment but are not privy to what is going on inside an application.

"It's about time," said John Collins, chief information officer at Plaza Home Mortgage Bank in Santa Ana, Calif., and a Powerwatch customer. "You can manage everything else down to the workstation level [in client/server computing], but we haven't been able to have an app tell us, 'Hey, I'm going down.'"

AMS echoes some growing user concern that traditional network and systems management tools are just not up to the task of managing intricate applications spread across widely dispersed desktop machines and servers.

"What we're looking for in these [applications management] tools is APIs that allow us to tie our custom applications into them," said Pompei Malik, MIS director at Brewers Retail, Inc. in Mississauga, Ontario, and a Tivoli user.

In addition to collaborating with Powerwatch, Tivoli plans to powerwatch AMS for packaged applications. A first step will be an AMS module for SAP AG's popular R/3 client/server suite of applications. Scheduled for delivery later this year, it will sell for \$8,000 per R/3 server.

Powerwatch plans to ship AMS-compliant software for Powerwatch later this year. Pricing was not available.

There may be a hitch in the plan, however. Even though Tivoli and Powerwatch positioned AMS as an open approach, analysts last week said it is still a Tivoli-centric solution.

"Tivoli is on the same sort of tack that [Hewlett-Packard Co.] is with their [OpenView] Operations Center—opening up APIs and persuading people to standardize on them," said Paul Mason, a research manager at International Data Corp. in Framingham, Mass.

Another problem could be Tivoli's heritage. "Tivoli is very strong in Unix environments but not so much in Windows or OS/2 or other desktop environments," said Dure Pasmore, a consultant at Decalis, Inc. in Herndon, Va.

# IBM unifies SystemView

By Patrick Dryden

When IBM reinstitutes its SystemView systems management platform this week as a unified product, longtime users will see a new IBM heading their pleas for simplicity and coherence in the task of taming distributed networks.

The unified version of SystemView, developed as part of IBM's Karat initiative, frees network and systems administrators from having to deal with IBM's separate divisions. It delivers diverse products in a single point of installation and support with a single graphical interface for managing complex network and systems functions.

"They recognized [that] all those applications written for different platforms by different IBM units were too confusing, so they did the integration and simplified the management," said Tim Wilcox, a management analyst at Decalis, Inc., a consultancy in Herndon, Va. "And Karat is geared at distributed client/server sites, unlike prior NetView and SystemView tools."

## Next up...

But IBM will not deliver other key platforms for the Karat initiative until later this year, and third-party support remains scarce. The first step — an AIX-based console that enables drag-and-drop management of almost two dozen IBM network and systems management products — is a big help, users said. But

a true object-oriented implementation will not appear until sometime next year.

"IBM is headed in the right direction," said Art Glover, vice provost for information technology at Virginia Commonwealth University. "I just wish they could do it faster."

Glover said he expects to put this first "manager of managers" to work in a central network control center in June. That will help the university centralize management of four computing centers and diverse systems throughout the medical and academic campuses in Richmond, Va., Glover said.



## Message received

The new approach is a welcome change, said Larry Bosdane, associate director of network integration services at the New York headquarters of pharmaceutical giant Pfizer, Inc. "They've gotten a wake-up call on simplicity and unity all their products," he said.

This time around, IBM chose the right management architecture — an object-oriented framework with request brokers that group functions under icons — because that is how administrators work, said John McConnell, principal at McConnell Consulting, Inc. in Boulder, Colo.

"It's very clear IBM is trying to be a customer-driven company," McConnell said. "This demonstrates that they got the message. Now they have to demonstrate that they can deliver on their promise."

# Novell shows backbone

By Elizabeth Heicher

Novell, Inc. hopes to give users moving to object technology the software backbone they need to let many different kinds of objects communicate.

The company will provide users with pieces of this infrastructure by building a repository and including an object request broker in the NetWare operating system, Bob Frankenberg, Novell's president, chief executive officer and chairman said last week. Frankenberg spoke at a forum hosted by the Patricia Seybold Group.

Helping to tie together different object models, including those from IBM and Microsoft Corp., will be an object repository that serves as a place to store information about multiple kinds of objects, Frankenberg said by pointing pointers to where objects are stored around a network, repositories allow objects to be retrieved when they need to be used by, or use, an application.

"It's an interesting opportunity," Frankenberg said of the repository, adding that products from Novell will address this area in the next year. Microsoft and Texas Instruments, Inc. are jointly designing specifications for similar products, which are not expected to be commercially available for at least

18 months.

Frankenberg also reaffirmed that Novell will add more object support to its NetWare operating system. "We'll see the underpinnings of OpenDoc get strong network support," he said, with support for IBM's object models.

System Object Model and Distributed System Object Model — as well as for Microsoft's OLE object technology.

Novell will also adopt another vendor's object request broker and place it on NetWare servers, Frankenberg said. This is likely to reach users in about 18 months, he added. Object request brokers will manage object communications on the LAN.

## Hard to tell

Giving the complexity involved in building an open object repository, details of Novell's plans are too sketchy to judge, said John Byrner, vice president of Patricia Seybold Group in Boston. "Bridging different object models is quite difficult," he said. "Is it going to scale?



For users who need different kinds of object-oriented applications to work together, object request brokers can help by enforcing a standard way for all the objects involved to interact.

two have been very slow in developing the repository, he added.

Meanwhile, some of Novell's customers are too concerned with current problems to worry about future object technology support.

"I want to know where Novell is going in LAN and messaging," said Kenneth Wilsey at BellSouth Corp. in Atlanta. He said he is concerned about integration issues and does not see a current need for an object repository.

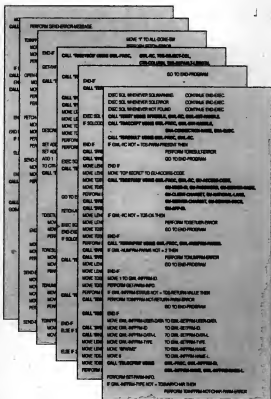
# COMPARE MAINFRAME DATA ACCESS

# Sybase

**71 lines proprietary code**

# Oracle

**0 lines proprietary code**



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The Sybase code on the left queries rows from one DB2 table and returns those rows to the client. This simple query example, taken directly from Sybase's "Open Server-Mainframe COBOL Programmer's Reference" manual, requires you to embed 71 lines of proprietary Sybase gateway code into a 222 line mainframe COBOL program.

To access mainframe data with Sybase's "Open Server" you must rewrite your existing mainframe transactions and embed Sybase proprietary interface calls. In contrast, Oracle's "Procedural Gateway for APPC" uses standard IBM APPC interfaces, so you can access mainframe data using your existing mainframe transactions without modification.

Furthermore, because Sybase uses a proprietary interface to access mainframe data, you must install and run their "Open Server" product directly on your mainframe. Since Oracle's "Procedural Gateway for APPC" uses standard IBM APPC interfaces, no additional software on your mainframe is required.

Finally, Oracle's standard APPC interface runs much faster than Sybase's proprietary interface, so you access your mainframe data more quickly as well as more easily. If you want easy-to-use, standards-based, fast mainframe data access technology call Oracle at 1-800-633-1071 Ext.8118.

\*\* Taken directly from Sybase Open/Server Mainframe COBOL Programmer's Reference, pgs. C-3 through C-14. © 1994

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# Remote sites prey for Informix release

'Nearest warm body' could manage this workgroup database, company says

By Kim S. Nash

Informix Software, Inc. plans to ship a workgroup-level database late this year, several months behind rivals Oracle Corp. and Sybase, Inc. However, Informix's OnLine Workgroup Server is expected to provide capabilities the others do not, such as image and multimedia support.

Informix in Menlo Park, Calif., is expected to announce the limited-user version of its OnLine database this week at the DB/Expo show in San Francisco.

The product, as do others like it, targets large companies such as banks or retail chains that want to set up databases at remote sites or in small departments. Key to fulfilling that need, however, is making the database easy enough for local information systems staffers to install and maintain, observers said last week.

"Most companies can't afford to have high-level database administrators at every site or every bank branch to keep these products working properly," said Morgan Gerhardt, an analyst at Meta Group, Inc. in Stamford, Conn.

## Easier installation

To that end, Informix plans to include graphical administration utilities designed to make OnLine Workgroup Server simpler to install than its high-end OnLine console. For example, users will type in the number of clients that the database is to support and the install program automatically configures the product, said David Watson, director of database development at Informix.

The goal is to allow the server to be managed

by "the nearest warm body, whether or not he has much database experience," Watson said. OnLine Workgroup Server was also designed to handle multimedia data, such as audio and video. Similar low-end products from Sybase and Oracle cannot manage those data types, although each offers separate high-end databases with those capabilities.

Sears Merchandising Group likes the relatively small footprint of Informix's OnLine Workgroup Server, said Bob Check, director of development support at the giant retailer in Hoffman Estates, Ill.

Informix's workgroup database, which was designed for two to 32 users, needs 16M bytes of memory. Oracle's Personal Oracle 7 also requires 16M bytes but supports just one user.

Sears has started downsizing several large mainframe applications to Informix databases. Informix's OnLine IBM RS/6000 servers [CW, March 20]. The company also wants to put limited-user versions of OnLine in more than 3,000 retail stores.

"If we had to go with another workgroup database that needed more resources, installing PC servers with lots of memory would be a pretty expensive proposition," Check said.

However, workgroup servers from Oracle and Sybase run on more platforms than will Informix's OnLine Workgroup Server. Informix will bypass IBM's OS/2 and Novell, Inc.'s NetWare, sticking strictly to Microsoft Corp.'s Windows NT. The Santa Cruz Operation's SCO Unix and Novell's UnixWare, Watson said, OS/2 and NetWare "are going to die," he said. But he noted that UnixWare is not a powerhouse either. Fewer than 1% of Informix's OnLine license sales — \$469 million last year — were UnixWare systems, he said.

Oracle, Sybase, others plan improved utilities this year. See page 65.

# Banyan users find happy Tomorrowland

Free Vines 6.0 directory helps meeting mood

By Laura Dilio  
DELANEO, PA.

Maybe it was Space Mountain. Or maybe it was the formal announcement of Banyan Systems, Inc.'s Vines 6.0 network operating system and how the company will give away its StreetTalk directory to users for free.

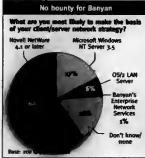
Whatever the reason, the 1,000 customers at the Association of Banyan Users International conference here last week looked more like happy Mountie-rites than users at a staid technical meeting.

Vines 6.0 has been expected for some time and will include features such as guaranteed log-in for remote users even if the home server is down [CW, April 24].

Chris Behning, vice president of MIS at General American Credit, Inc., an appraisal and title search firm in Pittsburgh, said he is especially enthusiastic about the new online support for TCP/IP client workstations in Vines 6.0 even though he does not plan to upgrade from Vines 5.54 until next year.

"Native TCP/IP support is especially important to us because all of our users are establishing Internet connections," Behning said. "I also like the idea of Universal StreetTalk very much. It's a proven directory service, and giving it away" is Banyan's way of trying to lure developers.

Another longtime Vines user, Ray Giandrea Jr., senior network specialist at Hanzford Brothers,



Inc., the parent company of Shop and Serve supermarkets in Scarborough, Maine, voiced his support for the enhanced remote access capabilities in Vines 6.0.

"I love the improved remote access in 6.0. Anything's an improvement over the current DOS-based remote access, which doesn't integrate with our Windows desktops," Giandrea said.

Giandrea acknowledged that he sometimes feels like a Vines "apologist" because of Banyan's small market share. "Banned cyberspace from the higher-ups are easier to take when you consider that — unlike Microsoft, which stalls on all its release dates — I know Banyan always delivers when they say they will," he said.

But Bob Bakalukany at Aberdeen StreetTalk in Boston said that despite Vines' technical superiority, Banyan still has not addressed its major weakness: marketing. "Maybe they should hire Mickey Mouse or Goofy to sell Vines. They couldn't do any worse."

# Digital users upbeat, but concerns remain

Reduced field staff, cuts in direct sales force cited

By Neal Weinberg

For Digital Equipment Corp. users, there is nothing like two straight quarters in the black to sweep away the blues.

Although some nervous issues still remain — among them support and the lack of a coherent software strategy — Digital customers are saying the mood at next week's Digital Equipment Computer Users Society (DECUS) conference in Washington will be much improved over the tone of other recent user gatherings.

Mike Schoenberger, systems manager at

ANB Investment Management and Trust Co. in Chicago, said he is relieved that Digital appears to have survived its brush with financial disaster.

"Certainly a company you have put a lot of effort into developing software and applications for, you hope it's not going to go out of business tomorrow," he said. Schoenberger recently migrated from the VAX 6400 to the Alpha 2100 server for portfolio management and other financial applications.

DECUS U.S. President Margaret Knox said user confidence is on the upswing. But

## Top 5 concerns for Digital users

- 1 Availability of Alpha-based applications on all three Digital operating systems
- 2 Fate of Rih software following sale to Oracle
- 3 Continued support for VAX hardware
- 4 Service and sales support in light of staff cutbacks
- 5 Lack of overall software strategy

Source: User interviews.

people are still concerned about a variety of software, service and support issues, she added.

John Baines, manager of information technology at Douglas & Lemmon Co. in Farmington Hills, Mich., said he is pleased with Digital's products but worried about service because the field staff has been "trimmed back to a skeleton point."

And John Christinasen, supervisor of computer services at Idaho Falls School District 91, said that after the sale of Rih to Oracle Corp., he worried about Digital's selling off other software lines. But those fears have somewhat abated.

Digital is still fighting to break into the Top 5 — that Top 5 — in PCs. See page 41.





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# Forest Service overhauls IS network

By Jean S. Borman

The U.S. Forest Service this week will begin the daunting task of revamping its entire information systems network, moving from aging minicomputers to hundreds of IBM RS/6000 Unix workstations, servers and X Window System terminals.

In one of the largest geographic information systems (GIS) contracts in the federal government, IBM will provide the Forest Service with up to \$275 million in Unix workstations, servers and related software in the next eight years.

The ultimate goal is to give up to 30,000 users in 43 states a clear picture of all Forest Service data on resources and wildlife and the ability to access it online on matter where they work.

But in this case, there is forest, there is also fire.

Data General Corp. said it will continue to protest the agency's contract award to IBM by filing a suit with the Court of Appeals for the Federal Circuit this week in Washington. DG is appealing the decision made by the General Services Administration's board of contract appeals after DG bid its own Avion Unix systems.

"This is still active litigation," said DG

spokesman Jim Dunlap. The IBM RS/6000s are displacing 900 DG Eclipse/MV minicomputers. DG had supplied the Forest Service with MV minis since 1983.

The Forest Service project will be one of the biggest installations of the Open Software Foundation's Distributed Computing Environment (DCE). DCE software will ensure user identifications and security and will connect any user with any database server.

"Eventually all of their data will be available to all of their people, no matter where it's located," said Jack Brown, manager of resources management and distributed systems at IBM Government Systems in Boulder, Colo.

## Paper troubles

The central obstacle to having wide-spread on-line access to data is paper—lots of it—on which much of the agency's key land area, ecosystem, wildlife records and fire protection data is stored. "Most of the data is not in a GIS format," Forest Service Chief Information Officer Bill Brydow said last week. "In some areas, we still use paper and Mylar maps."

Using GIS software from Environmental Systems Research Institute, Inc. in Redlands, Calif., and Oracle Corp. database, the agency will be able to reformulat

data and generate new maps as needed. Users will be able to access data stored on either the DG minicomputers or the RS/6000 systems using distributed systems software, an FTS 2000 network and client/server queries to Oracle databases.

"GIS... gives us an opportunity to retol the way we do business in the field," Brydow said. The task of re-engineering current Oracle applications will fall to Forest Service programmers using Oracle computer-aided software



The Forest Service's Bill Brydow: GIS lets us automate our spatial resource data.

engineering tools, he said. Getting to the point of ordering up the new Unix systems has not been easy. The U.S. Department of Agriculture, which runs the Forest Service, is undergoing its own systems downsizing and revamping. "It's difficult to implement a program when things are relatively stable," said Bob Dorman, senior vice president of Federal Sources, Inc. "It is substantially more difficult when the organization and offices are in a state of flux."

## Burning up bytes

The U.S. Forest Service will be able to leverage its seven years of investments in Oracle databases and data networks as it replaces Data General minicomputers with IBM RS/6000 Unix workstations and servers.

Other technical highlights of the project include the following:

- Oracle databases on DG and IBM machines, which will communicate via the OSF's DCE software.
- DCE unifies dissimilar systems with a

common file structure and security scheme.

A Hundreds of RS/6000 Model 390 desktops, Model 540 desksize servers, PowerPC-based Model C161 minis and Model 520 PowerPC-based workstations.

A GIS software from Environmental Systems Research Institute, which will be used throughout the agency to ease training efforts and unify data under the same digital format.

• Office automation software from Applix, Inc. in Westboro, Mass.

—Jean S. Borman

## News Shorts

### Silicon Valley teams to fight against chip theft

Worried of millions of dollars in chip thefts each year, Silicon Valley forces joined last week to create a nonprofit agency to slow the national trend. The American Electronics Association, the U.S. High Tech Crime Task Force and the Chubb Group of Insurance Cos. in Warren, N.J., announced the High-Technology Theft Prevention Foundation in San Francisco. The group plans to use computers to pool data from police and corporate sources as well as create training materials that show firms how to prevent break-ins and robberies.

### HP to swap out flawed chips

In the wake of publicized manufacturing flaws in thousands of its top-of-the-line PA-RISC chips, Hewlett-Packard Co. said last week it will swap out any flawed chips, avoiding a repeat of Intel Corp.'s Pentium mathematics flaw debacle. In all, a total of 20,000 machines shipped since last fall may be affected, HP said. That includes HP 9000 Model 700 workstations, some HP 9000 commercial servers and HP 9000 proprietary servers—all of which are based on the same chips.

### Court questions ruling

A federal appeals court hearing last week seemed to confirm the conventional legal wisdom that U.S. District Court Judge Stanley Sporkin erred

when he rejected the government's 1994 antitrust settlement with Microsoft Corp. based in part on anonymous accusations represented by attorney Gary Reback [CW Feb. 29]. "We're terribly concerned about whether the District Court went beyond the allegations in the complaint," said Judge Laurence H. Silberman at the U.S. Court of Appeals in Washington.

### OpenDoc tools coming

Two key vendors backing OpenDoc, an object technology for sharing data and functions among applications, last week said they will deliver tools to make it

easier to develop OpenDoc applications. Novell, Inc. will extend its AppWare tools so they can be used to build OpenDoc parts—the building blocks for applications. However, AppWare developers using Windows will not get the tools until next year, Novell said. Meanwhile, IBM confirmed that a Microsoft Visual Basic-like visual construction tool is in development can create OpenDoc applications. The tool will go into beta testing this year.

### Loral gets reprieve

The Federal Aviation Administration last week handed Loral Corp. in New York a \$655 million contract to replace hardware and software at the FAA's 30 Air Route Traffic Control Centers. The new systems are intended to safely increase airspace capacity. The award comes despite pressure from several government quarters to scrap the contract with Loral, which is playing a leadership role in troubled \$7 billion air traffic control modernization program.

### Keyboard plaintiffs fail

A federal jury in Philadelphia last week decided that keyboards made by IBM and Atek, Inc. were not responsible for a newspaper reporter's painful wrist injury. There are more than 2,000 such product liability lawsuits pending, and this was the fourth court victory for

the vendors [CW April 3].

### Human touch gets costly

First Chicago Corp. launched a controversial plan last week to start charging some customers up to \$3 for teller services in an effort to prod customers into using more cost-efficient electronic banking services. The plan excludes customers who keep a balance of greater than \$2,500 in their checking accounts. However, customers whose checking accounts require no minimal balance will be charged \$2 each time they make a phone transaction requiring a human attendant. If an automated system could have handled their needs.

**SHORT TAKES** Open Market, Inc. in Cambridge, Mass., received a vote of confidence last week from three media firms. Tribune Co., Advance Publications, Inc. and Time, Inc. announced plans to use the company's electronic commerce software and services to distribute their content over the Internet. Lehman Brothers, Inc., a New York-based investment bank, announced plans to lay off 100 to 125 employees in its systems and operations staff at its Jersey City, N.J., office. Continental Cablevision, Inc. in Boston has signed a five-year, \$5.4 million outsourcing agreement with Systems & Computer Technology Corp. in Malvern, Pa.

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Unisys vs. AT&amp;T GIS

# Showdown at the parallel corral

By Neal Weinberg

The comeback trail for the industry's two mid-America middleweights is leading to a showdown in the parallel processing arena.

Mainframe Unisys Corp. in Blue Bell, Pa., last week fired a direct shot at AT&T Global Information Solutions in Dayton, Ohio, with OPUS, its open parallel Unisys server.

The Unisys strategy is to offer custom-

ers in certain industries a complete, Unix-based decision-support system based on parallel processing in which multiple processors can work simultaneously on a task.

AT&T GIS, which owns about 60% of

the estimated \$1 billion commercial parallel processing market, countered last week with a new offering. The company enhanced its data warehouse solution, which runs on both parallel and symmetrical multiprocessing (SMP) systems, with an entry-level SMP offering. With SMP, all processors access the same memory through a common bus, which typically limits scalability to 12 processors.

"There's a clashing of categories," said Gary Smaby, president of Smaby Group, Inc., in Minneapolis. For customers, the technological distinctions are irrelevant; what matters is which company offers the best business solutions, he said.

Unisys Chief Executive Officer James Unruh last week predicted OPUS sales would hit \$100 million this year. But Smaby said it will be a challenge to sell commercial customers on parallel processing, which has long been viewed as the domain of scientific and technical users.

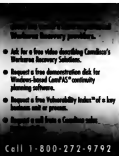


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to handle 7,500 calls the first business day after the blast.

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Our customers were amazed and gratified that we were able to recreate the business to meet their needs first thing Monday morning. Our seamless recovery also helped us land several clients we had been pursuing — and we didn't

### OPUS — Open Parallel Unisys Server

Processor: Intel Pentium  
Microkernel: Chorus from Chorus Systems  
Scalability: Up to 64 processors in one cabinet  
Availability: May 95  
Price: \$665,538 for 8 processor system with 4GB bytes of memory

"We have situations where it would be very nice," said Gerry Hendrix, vice president of technical services at National Health Systems, Inc. in Englewood, Colo., a Unisys mainframe user. "But as far as running out and buying one — not just yet."

### Fear of the unknown

Hendrix's reaction is typical of mainframe shops. They are "not real familiar with parallel processing. Their first instinct is, 'No way; it's not reliable, and it's too hard to program,'" Smaby said.

Price is another issue. "Knowing Unisys, it's probably going to be sky-high," said John L. MacNamara, director of information systems at Waukesha-Peacore Industries, Inc. in Houston.

A Unisys System 80 mainframe customer, MacNamara said he is planning to move his applications to either Unix or Microsoft Corp.'s Windows NT soon but has not yet made a decision.

Law Brentana, a partner at Bennett Co. in Sudbury, Mass., said he is impressed with Unisys because the company has combined hardware, software, database and applications in very defined areas such as decision support for home improvement centers.

He said the strategy has its risks. "If it doesn't work, their name is mud throughout the whole vertical" market.

The Unisys system is a combination of technologies, including Intel Corp.'s Pentium microprocessors, Novell, Inc.'s Unix operating system and a microkernel from Chorus Systems. Both Oracle Corp. and Red Brick Systems have ported their databases to the platform.

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# Start-up eases printing to nets

By Patrick Dryden

A user's work on a document usually isn't done until the memo or spreadsheet is printed out or sent along electronically to someone else. Daztel Corp. hopes to make that easier for users on TCP/IP networks with a new version of its namesake software, announced this week.

Most users print or fax their documents to the printer designed for their workgroup. More administrators use a utility to direct a file across the network to a printer near the recipient. But they have to hunt for their target, figure out if the printer can handle their document and then monitor the process.

Because of this complexity, some administrators long for a new way of handling users' output. Mainframes use a utility called Job Entry System to handle it, but little has been available in the client/server world.

There is a definite need. "We just started an output management project to try making all of our network's destinations available to every user," said Michael Karlsen, systems manager at Hewlett Associates, a benefits consulting firm in Lincolnshire, Ill. "Our clients demand reports in every format from 80-column printouts to laser discs, so any kind of universal output translator definitely sounds interesting."

Last fall, Daztel took a stab at this market with software that lets users select one or more targets — printers, fax machines and gateways to electronic mail and pagers — from a display of icons. Daztel then converts the source document and delivers it.

But this initial release also required users to have some foundation of the Open Software Foundation's Distributed Computing Environment (DCE) middleware.

## Daztel Delivery for Unix

What it is: Server software to manage delivery of print output for users on TCP/IP networks.

How it works: Client software on Windows or Mac desktops intercepts print commands and directs them to the server, which displays icons representing available targets on and off the network. Targets can include printers, fax machines or electronic mail and paging systems. The server translates the command to the proper format and tracks delivery.

Requirements: AIX, HP-UX, Solaris or SunOS server platform and Daztel Express for each user.

Price: Daztel Delivery for Unix starts at \$10,000. Daztel Express is \$99 per client.

## Split camps

In Daztel's newest version, the DCE requirement has gone away. New this week is Daztel Delivery for Unix, which can work with virtually any TCP/IP network.

On one hand are customers such as Burlington Northern, Inc., which will use Daztel's DCE version for the core business function of tracking trains in one part of its re-engineering efforts (CW, April 10).

And on the other hand are users such as HAL Software Systems, Inc., which has no intention of adopting DCE and was glad to get the new Daztel server, according to Tom Lang, director of software development in Austin, Texas.

"Daztel ties together features you can get separately in a nice graphical interface," Lang said. "Our sales staff can set up a mailing list with icons instead of having to know administrative functions. We can fax update bulletins and even send network alerts in pagers."

"Other vendors only do part of what Daztel does," said Patrick McBride, a vice president at Meta Group, Inc., a Westport, Conn., consultancy. "But Daztel needs to directly support Novell NetWare, where most of the world's clients start their printing."

# Picture this!

PictureTel's videoconferencing line offers improved video, audio

By Tim Ouellette

PictureTel Corp. rounded out its group videoconferencing product line last week in New York with product announcements for both the high and low ends.

Group videoconferencing systems take a number of users, usually in a conference room situation,



PictureTel's Conqueror 4500 offers simultaneous two-way conversation.

conduct meetings with people at other sites. This is different from desktop videoconferencing, which is usually done between single users

at their desktops.

The new systems range from the high-end Conqueror 4500 to the midrange Verso 2000, which is designed for new users. The Montage 300 series of multipoint conferencing servers provide increased bandwidth support, with a range of standard and proprietary video compression algorithms.

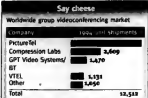
"A major part of this announcement is that PictureTel has been historically in lower bandwidths, and now they are going up to T1/E1," said Sarah Dickinson, program director and senior analyst at Personal Technology Research in Waltham, Mass.

Easy to use features — including a wireless keyboard and Look At Me Buttons that users hold and press to move the camera in their direction — have been added to simplify conferencing.

When conducting a conference,

"My feet are up on the desk, kicking back with the [wireless] keyboard in my lap, and the keyboard still works from any angle," said Hedi Aboukhatir, an operations manager at Link VTC, Inc. in Boulder, Colo.

PictureTel's new servers feature backward compatibility with the rest of its product line, allowing



Source: Personal Technology Research, Waltham, Mass.

the Danners, Mass., company to leverage its large base of installed group systems (see chart).

Texas A&M University uses PictureTel's System 4000 line and beta-tested the Conqueror 4500 to conduct administrative meetings and classes with other groups. "Both the audio and video are improved, especially the audio," said Gary Betts, video operations coordinator at the College Station, Texas, school.

The Conqueror 4500 provides simultaneous two-way conversation and includes both SGA, a proprietary algorithm for improved frame rates and motion handling, and H.263, the industry standard.

PictureTel expects unit growth to come mostly from users of Vane 2000 in small business and remote offices because it provides a graphical user interface to control the system. PictureTel's high-end systems use the keyboard and a menu system for control.

The Conqueror 4500 costs \$43,900, the Verso 2000 costs \$21,900, and the Montage 300 costs \$35,000.

# Novell gets max out of fax

Routing software saves paper, cuts costs

By Laura Dixon

A new fax routing technology from Novell, Inc. announced at last week's Comdex/Spring '95 trade show could slash the cost of sending faxes throughout large corporate networks and save trees in the bargain.

Autorate, due out in the second quarter, adds document-routing capabilities to fax, copier and printing devices, said Daryl McBride, vice president and general manager of Novell's Extended Networks Division in Orem, Utah.

With Autorate, McBride said, companies will save money because there will be much less fax replication, or multiple faxes sent to the same person. Paper will also be saved in another way: A digitized image can be sent instead of a paper fax.

A recent study conducted by the Gallup organization for Honey Bower Corp. found that large businesses racked up an average \$13.6 million in fax-related telephone costs annually.

Autoroute is one of the first applications to take advantage of Novell's Embedded Systems Technology (NEST) software developer's kit. The NEST kit was designed to



extend NetWare into any intelligent device, including consumer appliances.

Autoroute uses the standard Group 3 T20 fax protocol for routing information. This gives end users a unique Autroute fax ID to ensure that faxes are routed to the correct destination. This way, faxes can be sent directly to any device on a NetWare network equipped with Autroute. McBride said.

When used with the NEST software developer's kit, Autroute will exploit NetWare 4.x technologies such as NetWare Directory Services. So when third-party suppliers begin delivering products to end users — probably this fall — businesses will have to add only a software upgrade to their fax or office equipment to take advantage of Autroute, according to McBride.

Novell will license the Autroute technology to fax vendors for a nominal but underpriced fee, McBride said.



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# MCI's high-speed backbone service supports new NSFnet

By Michael Fitzgerald  
ATLANTA

MCI Communications Corp. last week kicked up efforts to expand its business beyond telecommunications with the Comdex/Spring '95 introduction of its very high-speed Backbone Network Service.

The service connects five of the nation's supercomputer centers on a 156M bit/sec. network and forms the backbone of a new National Science Foundation network (NSFnet), the basis of today's Internet. Using Asynchronous Transfer Mode technology, it more than triples NSFnet's current 45M bit/sec. data transport speeds.

In 1996, MCI will boost the network's speed to 622M bit/sec. While most commercial users will

not get access to the faster speeds any time soon, MCI Chairman and Chief Executive Officer Bert C. Roberts Jr. said the high-speed data transports in the new NSFnet will reach some portions of the commercial Internet by year's end.

"The basic elements of the network are already deployed, and we'll be bringing it up over time," Roberts said. MCI has allocated \$3 billion for capital spending in 1995, much of it car-



**MCI's NetworkMCI Business for Windows integrates on-line content with fax and E-mail capabilities**

marked for network infrastructure, he added.

The Backbone Network Service announcement followed MCI's introduction of a new version of its NetworkMCI Business for Windows package. The software package integrates paging, news services and other types of on-line "content" with the electronic-mail and fax capabilities to the previous version.

MCI and competing carriers want to increase usage of their networks through high-bandwidth, high-revenue applications such as personal videoconferencing. Yet many observers said these technologies will generate little revenue for some time.

"Business on the Internet is almost an experiment," said Ira Brodsky, president of Datacom Research, Inc., a consultancy in Wilmette, Ill.

He added, though, that the increased bandwidth "will really provide a boost to video and graphics capability."

And as at any recent Elvis sighting at 7-Eleven and trailer parks, everyone was talking about Windows 95, but nobody could find it.

The King may have been dropping a few hints to the faithful that a longer wait was in store for Windows 95: "We are anxious to get it out," Gates said. "We will be in great shape to finalize the product in August of this year."

Last week, Gates told several reporters from different publications that if the product was not done in August, Microsoft would pick another date in the fall.

If "finalized" in August, the product probably would not ship until October or November, most analysts said. Gen-

erally, it takes a software developer six to eight weeks to manufacture a standard product and ship it to distributors, who then ship it to retail stores. That means users may not get the product until December.

**Isn't nothing but a sound dog**

As one might expect, the combination of Windows 95 and the King was cause for hysteria among some attendees. In fact, one IS professional nearly fell off his chair laughing during the Windows 95 demonstrations at the Microsoft booth

when the vendor introduced the new operating system's reliability.

He returned to a reporter next to him



## Reality check

CONTINUED FROM COVER I

only when these three components are in place: Windows 95, a Plug-and-Play-ready BIOS, and hardware devices and drivers specifically enabled for Plug and Play.

While using Windows 95 on legacy hardware will reduce the need for user tinkering, it will not eliminate it.

Microsoft claims Windows 95 will recognize about 2,000 devices. These include most of the major brand-name products, both legacy and Plug and Play. Both classes of devices will lead themselves to easier configuration, which should be all but invisible to users.

But industry observers estimate there are 10,000 cards and devices out there. Microsoft said users should not expect Plug and Play to make cows jump over the moon—at least at first.

"People can get disappointed" with Plug and Play, cautioned Mike Flora, a technical evangelist at Microsoft. "An important differentiation that people may have missed is that Plug and Play works really well with Plug and Play hardware," but not always with legacy hardware, he said.

**Extra steps required**

This gap means, among other things, that users such as Joel Diamond will still be struggling with device incompatibilities. Right now, Diamond, a technical director at WugNet in Medford, N.J., has to open his PC and disable the internal modem every time he wants to use the printer.

"It's a nightmare to operate this [printer] on Windows for Workgroups," said Diamond. He uses a printer that shares interrupt control with his internal modem, so the two devices cannot be connect-

ed at the same time.

With the Plug and Play capacity in Windows 95, users expect such configuration snafus to disappear. But some other pieces of the puzzle must be in place first. Apart from the large installed base of legacy systems, other factors could also slow the migration to Plug and Play, including the following: The slowness of some hardware vendors to produce drivers ready for Plug and Play. This means a number of even newer peripherals — from SCSI devices and audio cards to Peripheral Component Interconnect bridging devices — will not be prepared for Plug and Play.

People can get disappointed" with Plug and Play, said Mike Flora, a technical evangelist at Microsoft.

An important differentiation that people may have missed is that Plug and Play works really well with Plug and Play hardware," but not always with legacy hardware, he said.

when Windows 95 comes out.

vendors who failed to get their device driver information into the Windows 95 Device Information File in time. This piece of the operating system dictates what devices will be recognized. It may mean some of the latest adapter cards and peripherals will not be recognized automatically by Windows 95, even if they are supposedly ready for Plug and Play.

At WugNet, Diamond does not care how long it takes for Plug and Play to stabilize.

"We're changing 10 years of nightmares and if it takes two years, it's worth it," he said.

and said, "Twice I tried to put Win 95 on my NetWare server and twice it crashed."

Hey, at least it's consistent.

**Feels rush in**

Of course, where there is Elvis, there will also be Anti-Elvis. Rush Limbaugh made his counterpart present felt to Comdex attendees, though this time promoting a software product instead of family values.

Target Software Group in St. Petersburg, Fla., was promoting its Causalogs line of tutorial software as the "first software Rush is willing to stand behind."

Computerworld staff William Brandel, Johanna Ambraccio and Tim Ouellette contributed to this report.

## Reporter's

## Notebook

Georgia ain't Memphis — or Las Vegas, for that matter.

But devoted fans still gathered from higher and yon to see the Elvis Presley of software — none other than Microsoft Chairman Bill Gates — at Comdex/Spring '95 in Atlanta.

The King did not disappoint. Taking a page out of the "Elvis at the Fairgrounds" playbook, Gates made his adoring fans — who lined up on escalators wanting to file into the auditorium — wait at least 15 minutes before he took the stage.

## Temp execs

CONTINUED FROM COVER 1

ent executives is increasing at a rate of 25% a year, according to James H. Kennedy, president of Kennedy Publications, Inc. in Pittsburgh, N.H. His company publishes a directory of placements for temporary executives. Of the 250 firms in this year's directory, 43 list information services as a specialty.

"It's definitely the wave of the future," said Paul R. Dine, president of Dine Resources, Inc., an interim executive recruiting firm in McLean, Va.



"Anybody who has a family is probably looking for a greater sense of permanence, but that is a fading concept."

— Dick Brightman, a former IS director at RJR Nabisco in New York whose job was eliminated last month as a result of a corporate restructuring

nello, 47, began his second stint as a temporary chief information officer. This time it was at Bamberger Polymers, Inc. in Lake Success, N.Y., where he said he expects to remain in about nine months. Before that, he served as an interim manager at The Image Bank, a stock photography company in New York. At that job, he commuted several times a week from his home in Washington.

Sure, landing a permanent job with lots of security would have been ideal, "but you have to accept the idea that there really aren't many careers anymore," Manginell said.

"You can also make a lot of money doing this," he added.

## Money maker/saver

Dine said interim executives placed by his firm typically earn \$80 to \$125 an hour. The companies that hire them pay between \$75 and \$150 an hour, or about 30% to 50% less than what they would pay a consulting firm, he said.

But lower costs were not Bamberger Polymers' primary motive for hiring an interim IS executive. Rather, the company wanted people with proven IS experience and someone who could bring a fresh perspective to its re-engineering efforts, said Paul Coco, chief financial officer at the company.

"I could have gone to a consulting company, but from my experience consul-

ants tend to think at too high a level," Coco said. "We were looking for a nuts-and-bolts person who could get into a project almost as if he were part of our company."

## Trial offer

Some interim placements do blossom into permanent positions. Still other assignments are billed as temporary even though the company is looking to fill a permanent executive post. This try-be-

fore-you-buy arrangement gives employers and executives the opportunity to see how well they fit together.

"I liked the idea of being able to come in here and make a [long-term] decision after three months," said Douglas H. Dotson, who last year signed on as an interim director of operations and technology at Servus Financial Services in Herndon, Va.

On his 91st day, Dotson was named the firm's permanent chief operating officer.

Charlie Feld, who in 1981 voluntarily left his CIO post at Prito-Lax, Inc. to become acting CIO at Burlington Northern, Inc., said interim assignments are ideal for challenge seekers like himself, who thrive on start-up design and development work and re-engineering projects.

What is more, Feld said, is that "every CIO job is temporary. It's just a question of how you get paid. These are not long term jobs."

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NEW from the makers  
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# Uncle Sam sets up electronic meeting

By Gary H. Anthes  
WASHINGTON

If you have always dreamed of wrest a little control from Washington lobbyists and special interest groups, now is your chance to help shape public policy in the electronic age.

Starting today, and for the next two weeks, you can get on-line and tell Uncle Sam what he should be doing when it comes to the electronic delivery of benefits, services and information.

The "national electronic open meeting" will collect views on a wide range of issues such as network security, reliability, privacy, interoperability, intellectual property rights and much more (see box for Internet addresses).

## Forum purpose

While House officials promised that the results of the meeting will not be used to fill yet another report on the "information superhighway." Instead, the information will be used to help craft telecommunications and information policy and regulations, according to the Office of Management and Budget.

How well this experimental electronic forum will work is still unknown, the meeting sponsors acknowledged last week. "We have no idea how many comments we'll get or the quality of the comments," said a spokeswoman for the Na-

tional Telecommunications and Information Administration.

In addition to providing a toll-free telephone number for computer hookup, 400 sites across the U.S. will offer walk-in ac-

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# IBM/Cisco deal to ease legacy moves

CONTINUED FROM COVER 1

quite handy to manage the total network," said Allen L. Cooney, senior vice president of the Manager Data Division at Texas Commerce Bank in Houston, which uses Cisco routers.

Longtime IBM and Cisco user L. C. Smith, manager of network services at Hercules, Inc. in Wilmington, Del., said that while his company does not need the APFN functionality, he is pleased to hear about the alliance.

"I have a lot of confidence in both companies," Smith said. "The alliance with IBM and Cisco says that Cisco is trying to cover all facets of the market, and that's nice to know for my future migration plans."

## A helping hand

Cisco will announce its APFN move the week of May 15. It likely help both vendors. IBM is trying to give its large systems customers a migration path, and Cisco wants to establish itself in the market with the installed base of Fortune 500 SNA accounts in this country.

"The combination would let IBM satisfy their current customers' demands. This could be a very big push," said Frank Druebeck, president of Communications Network Architects, Inc., a consultancy in Washington.

The APFN move also shows Cisco is continuing its multiphase effort to provide routers to IBM's customer base.

Larinda Santolucito-Borovick, an analyst at International Data Corp. in Framingham, Mass., said it was a natural progression of Cisco's SNA strategy, although Cisco has fallen behind the schedule it outlined last year when it said it would ship a Data Link Switch (DLSw) in the first quarter of this year. A DLSw operates at a lower level than routers, allowing users to switch between legacy SNA and LAN.

"A lot of [router] vendors have backed away from this area [SNA migration], thinking it's not that big an opportunity," Santolucito-Borovick said.

This is an important statement from Cisco.

Other Cisco initiatives that will benefit IBM SNA customers — but which are also behind schedule — include the following:

- Support for RFC 1490, the industry standard for encapsulating SNA and multiple protocols over frame relay.
- Support for IBM's Qualified Logical Link Control protocol, which enables SNA devices to connect over an X.25 network.

• The Native Client Interface Architecture (NCIA), which extends Cisco's Internet Operating System to the desktop. This lets users access SNA applications via TCP/IP. NCIA was implemented as an option as SNA host access software via a technology agreement between Cisco and Wal Data, Inc. in Kirkland, Wash.

# ATM 'credibility gap' closing as products appear

By Michael Fitzgerald

Jules Verne wrote about rockets well before it was credible to imagine such otherworldly transports. Another such high-speed transport, Asynchronous Transfer Mode (ATM), is slowly but surely closing its own credibility gap.

Last week saw another piece or two fall into place for ATM, a high-speed data transfer technology. Its credibility was boosted with several alliances and a technology release:

- IBM and Memorex Telex Corp. announced a channel relationship for IBM's ATM products.
- Cisco Systems, Inc. said it would resell ATM adapter cards from Zeitler, Inc., a Santa Clara, Calif., start-up. Cisco also announced the first participants in its ATM Adapter Interoperability and Support Program.
- Market leader Fore Systems, Inc. announced ATM LAN backbone switches.

"You've got basic market development going on here," said Frank Druebeck, president of Communications Network Architects, a consultancy in Washington. He said IBM has focused on technology development at the expense of channel relationships, a problem the Memorex/Telex deal should help fix. Cisco is making its moves to expand into the low end of the ATM market, he added.

Meanwhile, Fore's ATM backbone switches are intended to help keep the company ahead of the competi-

tion in what will likely be a fiercely contested market.

Warrandale, Pa.-based Fore's new ASX-200EX and ASX-200EXE backbone switches add redundancy through devices such as dual-power supplies and also boost performance. Fore replaced its Saa Microsystems, Inc. SPARC architecture with Intel Corp.'s i860 RISC processor. The systems range in price from \$22,000 to \$78,000, and Fore said they will offer features and functions available from competitors only in higher-priced equipment.

## Interfirm fix

One user who purchased five of the lower-end ASX-200EX backbone switches said the market-leading, built-in 10K-byte buffer is also valuable for reducing network congestion — at least until more standards develop in the ATM market.

"We're ultimately hoping for a congestion control protocol out of the ATM Forum... but in lieu of standards, we'd like to see large buffers to help avoid congestion," said Javad Boroumand, a principal network engineer at Hughes STX Corp., an on-site contractor at

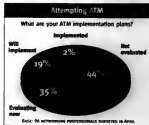
NASA's Goddard Space Flight Center in Greenbelt, Md.

For users, the many developments lend only some relief to what has been called the "Bizarro" state of the market. ATM "is still in the early evolutionary state, and it's going to take some time for it to mature," said David Meyer, a senior network engineer at the University of Oregon in Eugene.

Meyer said he is interested in the Cisco/Zeitler partnership because it makes Cisco a top-to-bottom player in ATM switches. At the same time, the university also uses Fore's ATM equipment because of Fore's top-to-bottom presence. Meyer said he will examine the Fore backbone switches.

Meanwhile, the IBM/Memorex Telex deal may help IBM hang on to some of its SNA customers as they migrate to technologies such as ATM using products from companies such as Cisco.

"It's important because Memorex Telex has a great customer base with an IBM orientation, and Memorex Telex is focused on pushing [ATM] right now," said Rick Villars, an analyst at International Data Corp. in Framingham, Mass.



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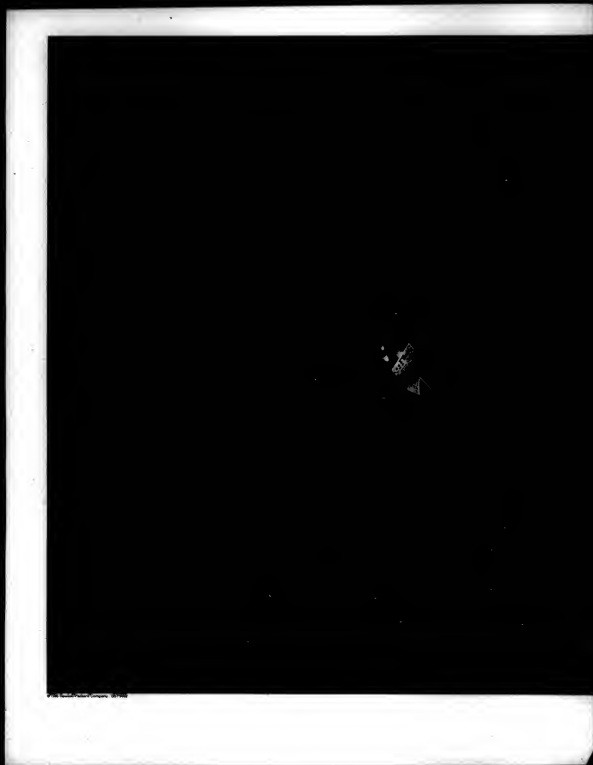
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Computer Systems

# On-line advertisers lust after bandwidth

By Thomas Hoffman  
CHICAGO

On-line advertisers are wrestling with the question of how to market products and services over the Internet and the World-Wide Web without infuriating cyber-slots or chewing up gobs of bandwidth.

"Bandwidth is one of the biggest issues to look at in on-line advertising," said Leslie Laredo, director of advertising development at AT&T Interchange Online Network in Cambridge, Mass., a service that will start up in June. "If you don't have a 56K bit/sec. or T1 connection to the Internet, downloading on-line advertising can be a real pain."

Indeed, purists have been adamantly opposed to on-line advertising, and occasionally even Internet surfers get annoyed when they are force-fed corporate pitches, which are time-consuming to toggle through.

Still, many marketers cling to the hope that Internet dwellers will eventually be interested in downloading ads to

## Follow the money

The low cost of advertising on the Web has helped spark it as an attractive medium. Jay Chiat, president and founder of ad agency Chiat/Day, said his firm has set up Web sites for ads of its clients for \$25,000 to \$50,000—a fraction of the millions many big-name ad agencies spend on television.

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find out more information about high-ticket items such as new cars. Advertisers admit, however, that they must walk a fine line to avoid being invasive.

"With our customers' permission, we'll send them [electronic-mail] notices to remind them of key birthdays and holidays 30 days in advance," said William Tobin, president of PC Flowers, Inc., a 6-year-old on-line florist.

Tobin and Laredo were two of the speakers who broached the sticky subject of on-line advertising at Jupiter Communications Co.'s Online Marketplace '96 conference held here recently.

Jupiter predicted that the 1.5 million current home Web subscribers will skyrocket to more than 40 million by 1999, creating a sizable and more meaningful advertising base to target. Currently, observers believe approximately 90% of all Internet surfers are males between 18 and 34 years old. More women, teens and older consumers are expected to go on-line.

Yet while advertisers search for the commercial pot of gold in on-line advertising, this unexplored landscape is still an unknown. "The only people who seem to be making money off the 'net' are those who invested early in companies like America Online and those who hold on-line conferences," said Jay Chiat, president and founder of Chiat/Day, Inc., an advertising agency in New York.

Don't count on freewill when you do business on the Internet. See page 72.

## Net savings

Want to save \$40 on your next copy of Microsoft Office?

Try tuning in to NEXC Direct, a new Internet-based computer products store that claims to offer lower prices and no retail middle-man.

Established by NEXC in Peabody, Mass., the service offers 20,000 computer products ranging from Microsoft Corp. software to Hewlett-Packard Co. printers.

A copy of Microsoft Office that sells for \$400 at CompUSA, for example, can be purchased through NEXC Direct for \$420, said Scott Randall, general manager of the on-line shopping service.

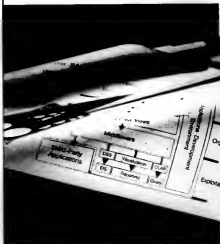
Orders can be placed via the Internet at <http://www.nexc.com>.

—Thomas Hoffman



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# Client/server workflow rolls slowly forward

By Rosemary Cadesso and Tim Ouellette

After years without a clearly defined role at many companies, workflow technology is poised to find a home with client/server applications. The question is, are users ready for it?

"Workflow is significant but not in the

short term," said Kathy Lenson, director of exploration and production systems at The Coastal Corp. in Houston and a user of PeopleSoft, Inc. software. "We are busy trying to get the products in, and we need to do that before we can start thinking about workflow."

Workflow software helps automate

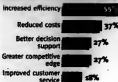
processes by triggering sequences of steps required to complete a given task, such as moving an expense report through a chain of command. Many observers said they think it is therefore a natural fit with client/server applications, which typically support re-engineered business processes.

A workflow-enabled client/server application would bring a higher level of automation to new business processes by automatically moving documents, routing tasks and triggering events.

During the next 12 months, all the big guns in the client/server application business plan to deliver workflow technology as part of their applications suites.

Late last month, PeopleSoft became the latest software provider to lock into a 1996 delivery date. SAP AG and Oracle Corp. have already committed to adding workflow technology later this year as a built-in component to upgraded releases of their applications.

What do you expect to gain from workflow software?



Based on Fortune 500 companies (multiple responses allowed)

Source: Forrester Research, Inc., Cambridge, Mass.

Dun & Bradstreet Software has offered workflow as a core part of its SmartStream client/server applications suite since 1993.

While the range of capabilities will differ, the workflow offerings are intended to streamline steps in application modules so users no longer need manually generate certain steps, such as requesting a sign-off on a purchase order.

In addition, the software companies intend to provide cross-module workflow so that events in an accounts payable module, for example, could trigger follow-up events in an accounts receivable module.

## Workflow made all the difference

Dave Labrin, a management consultant at Connecticut Health System in Hartford, Conn., is working on a SmartStream installation at Hartford Hospital. He said the workflow capabilities were a key reason for selecting the D&B human resources software.

"We are a very paper-intensive, labor-oriented company," Labrin said. Workflow "will be far more important to us as we try to re-engineer."

Workflow technology is typically sold as add-on tools or as built-in software components, and there is a wide span of sophistication among offerings. At the low end, workflow can refer to simply moving documents, such as expense reports, around a network.

At the high end, however, workflow can become the engine that runs a redesigned business process.

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# Scalable Performance

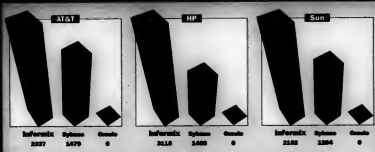
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# Andersen jumps into full-service outsourcing

Consulting firm to provide expanded services via third-party alliances

By Julia King

Andersen Consulting is racing to reinvent itself as a one-stop shopping center for client/server outsourcing services, as the consulting giant steps beyond its traditional bread-and-butter business in systems integration projects.

To get what it wants, the \$3.45 billion Andersen Consulting plans to take on everything from designing complex client/server systems to hiring and training the engineers, airline reservations or whomsoever else is slated to use them.

"We'll run accounting entries, and we'll fill out human resources forms. We'll also build the technology to be used," said Joelie Cornford, worldwide managing partner for Andersen Consulting's Business Process Management (BPM) practice. "What we're talking about is running an entire function for a company, inclusive of information technology."

Andersen Consulting's strategy for broadening its service offerings is based on forming alliances with a number of partners, which will act as subcontractors on its projects.

Last week, the consultancy's newly launched Sales

Effectiveness practice announced an agreement with Fuel Systems, Inc., a sales force automation software company in Menlo Park, Calif.

Last month, Andersen Consulting announced an alliance with General Electric Capital Corp. in Stamford, Conn., which will act as an information systems subcontractor and provide mainframe services to Andersen Consulting clients. Several other

partnerships, particularly with network providers, are also in the works, Cornford said.

Flexible pricing is another key element under Andersen Consulting's new outsourcing approach, and the company is banking that pricing will turn to distinguish the consultancy's offerings from those of archrival Electronic Data Systems Corp. and IBM's Integrated Systems Solutions Corp.

Under one option known as value-based pricing, clients will be charged according to business outcomes—such as a quantifiable increase in customer satisfaction—rather than by services rendered. Currently, about 15% of Andersen Con-

At a glance	
Andersen Consulting's outsourcing business	
1994 revenue: \$3,200	
1995 revenue: \$4,500*	
Number of clients worldwide: 155	
Number of employees: 3,500	
Target markets: Client/server-based information technology, logistics, customer service	
*Projected	

sulting's BPM clients have this kind of contract, Cornford said.

EDS, which already has a foot in the business process outsourcing market, also offers this type of pricing arrangement.

"However, where Andersen has had great insight is in taking on the broker's role," said Nicholas Kroll, an analyst at Merit Group, Inc. in Stamford, Conn.

"They're very much acting the role of a cross-industry facilitator or *broker* builder, and that is a great position to be in," she said. "Because of Andersen's global expertise, they're better positioned in that role than anybody else in the industry."

## Slow burner

But just how quickly companies warm to the idea of opening their arms to Andersen Consulting as a strategic partner is treated with critical business functions remains to be seen, said Tim Bourgeois, an analyst at International Data Corp. (IDC) in Framingham, Mass.

Many users, including Wayne P. Yetter, chief executive officer of Astra Merck, a pharmaceutical company in Wayne, Pa., have traditionally thought of Andersen Consulting as a systems integrator, not a strategic partner.

"We brought in Andersen [in 1991] to implement an [information technology] plan, not as a long-term partner," Yetter said. But now, three years later, he does consider the consultancy a strategic partner and credits Andersen with molding much of Astra Merck's business plan.

"We're a far different company today than what we would have been had I followed my original business plan," Yetter said. "I started [this relationship] as an IT project, but you can't really separate it from strategy, people and business processes."

Still, Bourgeois emphasized that "Andersen definitely needs to improve its perception in the marketplace as a provider of nontraditional services."

And that marketplace "is still really a mess," he added. "There's still a lot of smoke and barriers out there."



Price is right

Flexible pricing is a key element under Andersen Consulting's new outsourcing approach—and one that is banking on to distinguish the consultancy's offerings from those of its archrival such as EDS.

# EDS to add outsourcing support centers for PC LANs

Growing demand for network management services to be answered on a geographic region basis

By Patrick Dreyfus

PLANS, TEXAS

To meet the rising demand for client/server network management, Electronic Data Systems Corp. is preparing to offer a global outsourcing service for PCs and LANs by the summer.

The delivery vehicle for these new services will be support centers that customers in certain geographic regions will share.

EDS built itself by taking over data centers and consolidating some operations in megacenters linked by its worldwide backbone network. Now, the lumbering giant seeks to match other outsourcing providers by defining client/server support services and to surpass them by opening networked sites called Distributed Systems Management Centers (DSMC).

This option should help information systems shops cut their costs for managing far-flung LANs. Rather than staffing central or branch offices with their own experts, DSMC customers can leverage the expertise of scarce resources, said

Mike Bauer, EDS principal in the management consulting group.

Construction of the DSMCs—already staffed with 1,500 technicians and assorted experts—is the fruition of a two-year effort to reinvent EDS, said Larry Bissinger, EDS division manager for client/server technology services.

"We're trying to bridge our organizations to manage it all—from the data center to the desktop," Bissinger said. "Customers with large bases of PCs and LANs say they can't hire enough system engineers with the skills to support all the new technology and tools for enterprise management."

While the DSMC plan looks like a smart move, EDS did not have much choice, said Frank Casale, executive director of



"We're in the same boat as everybody else. Support must come from the network manager's perspective."

the field, said Marc Dodge, systems manager for telecommunications.

"We're in the same boat as everybody

The Outsourcing Institute in New York.

"All the big players realize that they must improve network support because data center outsourcing has plateaued," Casale said. Major outsourcing deals increasingly focus on complex network support, and the data center goes along with that, he added.

Companies such as United Parcel Service, Inc. are seeking new ways to manage their ever-expanding client/server networks. Currently, UPS relies on 2,000 LANs to join 64,000 client machines supported by about 1,500 network managers in

else. Support staff must stay flat or shrink, yet the network keeps growing," Dodge said. UPS is coping by unifying PC and LAN tools with help desk software to slow down the growth rate, he added.

DSMC technicians specialize in PC configuration and upgrades, key network components such as Cisco Systems, Inc. routers and Novell, Inc. NetWare servers and applications such as Notes.

"Now we can even offer to manage a Notes system—to let clients just use it, not have to support it," EDS' Bauer said.

Vendors such as AT&T Global Information Solutions, Digital Equipment Corp. and IBM have addressed the growing demand for network management services. But EDS could deliver significant assistance if this DSMC effort succeeds, analysts said.

"EDS is behind some other providers in actually doing this, but they haven't missed the window," said Mike Melonovsky, services industry research vice president at International Data Corp. in Framingham, Mass. "Demand for these services far exceeds the supply."



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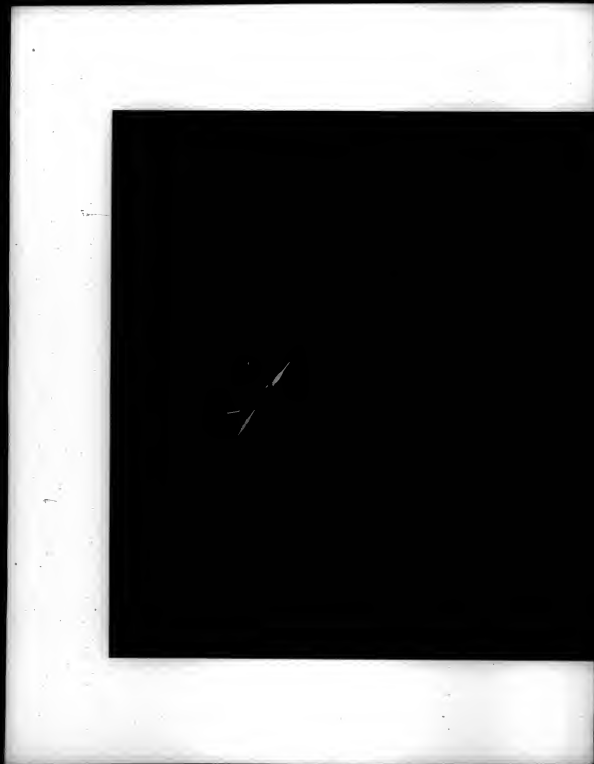
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# Computer Industry

## U.S. vendors score in Japan

Rising tide lifts Unix profits

By Jean S. Rozman  
TOKYO

U.S. computer vendors, working with Japanese trading partners, are riding a profitable wave of growth in Japan as Unix servers trend on territory once reserved for mainframes.

But the move to Unix servers, client/server computing and packaged software applications is still several years behind the pace at most major U.S. user sites, analysts said. And Japanese users, long accustomed to custom applications and turnkey systems from their suppliers, expect the same from Unix vendors.

Unix workstations, already widely used for computer-aided design in Japanese manufacturing plants, account for the lion's share of Unix sales here. The overall Unix market for workstations and servers is growing at 25% a year, and that growth generated nearly \$6 billion in revenue in 1994, according to International Data Corp. (IDC) Japan in Tokyo. Meanwhile, sales of mainframes remain strong because most business computing remains centralized. But the economic pressure inherent in Japan's post-bubble economy, combined with a strong yen, is making Unix servers attractive as well, analysts said.

### Blindling Sun

Leading the pack of U.S. vendors is Nihon Sun Microsystems, a wholly owned Sun subsidiary with a micro market share (see chart). Sun works with four major systems vendors — including Fujitsu Ltd. and Toshiba Ltd. — to deliver support-to-sales integrated systems. "We have a very broad coverage strategy, with thousands of resellers covering accounts all over Japan," said Gene Bauman, president of Nihon Sun, last week.

Sun's Japanese sales generate more than 15% of its total revenue. Major Sun accounts include photo-

print Nippon Telegraph & Telephone Corp. and Nippon Steel, which are both major Oracle Corp. sites. Like many U.S. users, Japanese companies tend to pair Unix servers with large database applications for user queries.

"Big companies have a lot of [mainframe] processing at the core of the company, but the frontline and service people have not had the data access they needed to really manage their customer base," said David Kellin, an analyst at IDC Japan.

For Hewlett-Packard Co., Sun's archrival in Japan

Unix goes East  
1994 Unix workstation and Unix server  
units shipped in Japan

VENDOR	UNITS SHIPPED	GROWTH RATE FROM 1993 TO 1994
Nihon Sun Microsystems KK	48,800	22.9%
Hewlett-Packard Ltd.	33,300	36.6%
Fujitsu Ltd.	27,000	37.4%
NEC Corp.	19,400	19%
Hitachi Ltd.	15,870	86.7%
IBM Japan Ltd.	8,850	28.3%
All others (44 vendors)	28,080	
TOTAL	181,200	

Source: International Data Corp., Japan, Tokyo

and in the U.S. Japanese Unix sales accounted for about \$1 billion of HP's \$25 billion revenue in 1994, analysts estimate. IBM Japan Ltd., however, had a disappointing sixth-place finish in the Unix market numbers. Analysts said IBM's continued focus on its proprietary systems and its successful showing in the Japanese mainframe market may have stolen momentum from IBM Japan's Unix sales.

Junichi Saeki, a senior analyst at Dataquest Japan, said partnerships between U.S. vendors and Japanese suppliers are the key to success here. Examples include Fujitsu's resale of Sun workstations and servers and Hitachi's resale of HP workstations.

## Desktop group feels Lotus' pain

Reorg expected to shake up unit

By William Brundell

After posting the first operating loss in its history two weeks ago, Lotus Development Corp. appears to be planning another shake-up of its desktop management group.

Lotus also faces the task of cutting \$50 million from its annual expenses and plans to eliminate 10% of its workforce, a Lotus spokesman said last week.

Industry sources said Robert Weiler will leave his post as director of international sales and marketing to head up the company's beleaguered desktop applications group. Weiler was not available for comment last week.

A Lotus spokesman said Weiler's move was not yet official. But the spokesman said Weiler and the current head of the desktop products group, Jesse Lang, are developing a new business plan for the desktop products business. Lang's place will be decided by that plan.

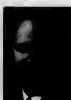
Weiler would be the fourth Lotus official to head up the desktop products group in the past year. A year ago, both the communications group and the desktop applications group reported to then-Chief Technology Officer John Landry. Today, Landry is in charge of only communications product development. After Landry's move out of desktop applications, June Roffel headed up the group until she was replaced a few months ago by Lang.

Analysts said Lotus is behaving like a company preparing for the selling block.

"Weiler becomes the de facto CEO of this part of the company," said Jeffrey Turtler, editor of "Soft Letter," an industry newsletter in Watertown, Mass. "It's pretty clear that they are setting it up to chop the company up like chicken parts, and then Weiler becomes a nice big drumstick."

A Lotus spokesman said that this was not the company's intent. "The idea is to drive profitability," he said.

At the earnings announcement two weeks ago, company officials said Lotus would be split into four separate operating groups.



Lotus' Robert Weiler could become "de facto CEO" of applications group

### Briefs

#### U.S. Robotics soars

U.S. Robotics Corp., in its first quarterly earnings report since it acquired Salt Lake City-based Megabits Holding Corp., reported record sales last week of \$186 million, 56% higher than the \$119 million from the year prior a year ago. Though the Middle, Ill.-based modem maker lost \$5

million for the quarter due to a \$21.5 million buyout charge, profits before the charge were a record \$16.8 million.

#### Piracy plague persists

Worldwide software piracy losses exceeded \$15.2 billion in 1994, according to the Business Software Alliance's annual global survey of 77 countries. While the U.S. and Switzerland showed the lowest piracy rates in 1994 — 39% and 41%, respectively — the U.S. dollar losses were the

highest, estimated at more than \$2.6 billion.

#### CA aids Gupta profits

With an assist from Computer Associates International, Inc., Gupta Corp. in Menlo Park, Calif., showed first-quarter progress in its return to profitability. CA's infusion of \$5.2 million, related to a license agreement, lifted Gupta's revenue from \$16.1 million to \$20 million. Gupta lost \$1 million in the quarter, com-

pared with a \$6.9 million loss in the prior quarter.

#### Merger takes bite

Storage Technology Corp. in Louisville, Colo., reported a first-quarter net loss of \$9.8 million. Company officials attributed the loss to \$20.7 million in one-time expenses related to severance packages and a March 7 merger with Network Systems Corp. StorageTek revenues for the first quarter, however, rose

15% to \$460.2 million.

SHORT TAKES Platinum Technology, Inc. has agreed in principle to acquire Advanced Software Concepts, Inc. in Escondido, Calif., a maker of distributed network storage management products. Second-quarter profits nearly doubled at The Santa Clara Corp. Operations, jumping from \$2.5 million to \$4.8 million on a 32% rise in revenue to \$63.5 million.

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## Big win for Win 95

If there was one message that last week's Comdex/Spring '95 in Atlanta hammered home with authority, it was that Microsoft's Windows 95 is going to be a big success. It has to be. The market won't let it fail.

While much of the gossip in the industry still centers on whether Microsoft can ship a stable, robust product in August as has promised, the question is really inconsequential in the product's future. The PC industry has too much invested to let Windows 95—whenever it ships—be anything but a hit.

Large software developers have already invested untold millions in rewriting their products for a 32-bit environment. They're counting on the payoff from customers who will shell out fees to upgrade.

Hardware makers are ready to put the muscles effectively in the role of informal and unpaid Windows 95 developers. If the Microsoft-supplied device drivers don't work properly, don't worry. The PC makers will fix them. After all, those memory-rich Windows 95 boxes will fetch about \$1,000 more per system than today's PCs, by some estimates.

Vendors are busily formulating marketing campaigns for Windows 95's rollout. At Comdex, vendors jostled anxiously to announce how quickly they could ship products after their operating system hits the shelves. Symantec has even stolen a march on the market—it has already delivered a Windows 95 version of Norton Utilities. And Lotus hopes it can get SmartSuite for Windows 95 out the door before Microsoft ships a competing version of its Office suite.

The Microsoft booth—all 2 quadrillion square feet of it—was crisscrossed with independent software vendors showing off their Windows 95 wares. The line to see Bill Gates' keynote speech snaked down two floors of the Comdex convention center. A lot of those people who no doubt he among the 400,000 users who are expected to actually pay to test the Preview version of Windows 95. Most software companies have to give their beta testers software for free.

All this anticipation must be particularly galling for the long-suffering legion of IBM OS/2 users, who can rightfully point out that they have had much of what Windows 95 offers for more than three years. And they're right. Windows 95's desktop interface, file management system, menu operations and utilities are all lifted directly from OS/2. And OS/2 offers true pre-emptive multitasking, something my own beta copy of Windows 95 conspicuously left out.

But, alas, superior products don't always translate into market winners. IBM's inability to excite the software market and PC makers about OS/2 has left it as the sole developer, support jockey and cheerleader for an otherwise excellent product. Microsoft, meanwhile, has convinced other vendors that their success is inextricably entwined with that of Windows. It's called momentum. And Windows 95 has it.

*Paul Gilpin, Editor*  
Internet: pgilpin@mc.com

With the advent of computer-related voice injuries we can expect to see:



## Consumers lose in Microsoft battle

Regarding "Activism key to fighting Microsoft monopoly" [CW, March 13], I am getting tired of hearing all the bleeding heart stories that Microsoft is some huge monopoly out to crush every competitor in its path.

The winners in the dog-pile Microsoft contest are Microsoft's competitors and the big losers are the consumers.

Before Microsoft became the powerful company it is, the software industry demanded outrageous prices for their products. Microsoft has brought software pricing down to a level that almost everyone can afford.

Antitrust laws were created to protect the consumer. Microsoft has helped the consumer over the years.

Wendell Whitehouse  
Bethel, Wash.

## No more Microsoft bashing

I love the way you start your editorial "While visiting Apple's headquarters..." [CW, April 3]. Talk about biased!

What do you expect Apple to say? Windows 95 could mean big losses for Apple. I am sick and tired of Microsoft bashing and hearing how Microsoft is killing Novell, Lotus, etc. Give me a break!

I have been using PC software for many years, and I like Microsoft products the most. If people liked Lotus products, they would buy Lotus products. It's that sim-

ple. It's called a market economy. We are responsible for putting Microsoft in its top position. What should we do now? Let's punish Microsoft for being too good!

Jose Molina  
Miami

## A way out?

I read with great interest the "Systems in the shamer" [CW, April 17] article. My nagging question would be what function the ESCAPE key performs in systems of this nature.

Dennis Caraccio  
Dharma Systems, Inc.  
Haddon, N.H.

## Let no profession be despised

I was offended by James Martin's Viewpoint piece "Evolution of a species" [CW, April 10]. Martin extolls information technology professionals not to become taxi drivers—"Don't allow yourself to become the next generation of taxi drivers"—as if taxi driving is worse than computer programming.

Whether you like it or not, right or wrong, computer professionals are often despised by other types of workers and a large number of people. Yet it's hardly right of you to despise taxi driving, and I can think right off the bat why a lot of taxi drivers would prefer their job— independence, flexibility, contact with other people, moving around.

Wise up.  
Julie McConert  
San Francisco

## Common sense

I am quite surprised at your wonder over Hitachi's decision to introduce its new mainframe line. PCs may be coming out rated at 120 MIPS, but those MIPS have very little relationship to 120 mainframe MIPS.

First of all, the instruction sets of the two types of machines are very different so the actual amount of useful work per instruction may be very different, and mainframes typically use extensive pipelining and parallelism that allow more setup work to happen concurrently with instruction execution.

In the past five years, I've watched our formerly productive industry degenerate into political warfare over what are acceptable computing platforms. What nonsense!

James L. Hanna  
Columbus, Neb.



\*Computerworld welcomes comments from its readers. Letters should not exceed two weeks and should be addressed to Bill Lashley, Editor in Chief, Computerworld, P.O. Box 9173, 375 Commonwealth, Framingham, Mass. 01701. Fax number: (508) 875-8932; Internet: bill@cmw.com. Please include an address and phone number for verification.

# E-mail: Not just for gossip anymore

Roger T. Sobkowiak and Ronald E. LeBlue

**T**he answer is: "A white shirt and tie, the authoritarian boss, the hierarchical organization chart and conversations around the water cooler." The question is: "Can you name four disparaging symbols of U.S. companies?"

Today we have casual dress for the office, the participative manager, the inverted pyramid or the self-managed team and E-mail as the medium for the rumor mill.

When employees gathered around the water cooler to share stories, gossip and rumors, they were limited in the information they had to share and exaggerate. They could pass their stories only to co-workers who visited the cooler.

Today, E-mail provides an opportunity for employees to create and share the same kind of information, but it delivers it at the speed of light and potentially to a much broader audience.

Many companies have policies that attempt to govern how the electronic water cooler is used. The all-purpose policy states that E-mail is company property and can be inspected at any time. But that is an '80s strategy trying to



Sobkowiak

*Maybe the employees at the water cooler are genuinely concerned about their job security or the company.*

control a '90s technology.

In the spirit of casual dress, management and teamwork, a corporate policy should state that E-mail communication is really a two-way street. People at the bottom and the top of the organization should use E-mail to share information and have their questions answered. E-mail use would be self-regulating. People would be expected to flag or question anything counterproductive on the system.

There are incentives for companies to open themselves up and engage employees in communication with an eye toward reaching a new level of performance. Companies can meet corporate legal requirements and at the same time encourage fledgling attempts to electronically connect and motivate employees.

How about a daily or weekly message from the president of the company? Or an "ask-the-president" channel that is accessible 24 hours a day to sort out rumors and misinformation?

What about a hot line on which employees can post their concerns or questions?

These are examples of how firms are trying not to make the water cooler conversation obsolete but to move it to a new medium with an expanded purpose.

Over the years, the water cooler has developed a mixed reputation. It conjures up an image of employees waiting time, sticking their noses into things they shouldn't. But how about a more positive image? Maybe the employees at the water cooler are genuinely concerned about their job security or the company and are looking for information to help.

Electronic connectivity takes the water cooler conversation to a new level, and signs are emerging that companies and individuals are up to the challenge. More companies are trying to go beyond the restrictive policies and figure out how to use the new mediums for employee communications to create a better company. Shall we start rethinking and reconsidering? Thrifty, anyone?

Sobkowiak and LeBlue are managing partners at Software People Concepts, Inc. in Monroe, Conn.

## Training for MIS failure

Michael Schrage

**R**emember the language lab in high school? Hapless students could spend a year cycling through tapes and still sound barely coherent in their language of choice. Technology didn't do a heck of a lot to improve linguistic fluency. Realistically speaking, immigration — not education — is largely responsible for our multilingual society.

You could make the same observation about multilingual IS organizations. Let's be serious: Three intense days at an airport hotel is not the cornerstone of object-oriented fluency. More often than not, the best object-oriented programmers in an organization have to be brought in from the outside. While well intentioned, most in-house training initiatives haven't lived up to the productivity gains their proponents promised.

Why not? The answer rests in how intelligent adults really learn, not in the traditional ways we prefer to teach them. Recognizing the fundamental difference between learning and being taught is now transforming how savvy IS organizations invest in their people. Formal

training is giving way to structured apprenticeships. Inactive companies are making symbolic education — the organized transmission of information — subordinate to mimetic education — learning by imitating master craftsmen.

High-intensity immersion in new programming environments, not extra hours of classroom time, are becoming the determinants of technology transfer. Simulation and group learning are supplanting guest lectures and vendor-sponsored retreats as the dominant modes for new learning.

To a large extent, this trend was anticipated by programming gurus such as Gerald Weinberg and Tom Lowe (who stresses the importance of object-oriented apprenticeship in his best book *Object Lessons*). Of course, the gurus had an unfair advantage over the educators: They paid close attention to how programmers and project teams learned new things. But, frankly, anybody who's tried to learn something new knows that the best learning comes from working with people who really know their stuff. Sure, there are always elements of "formal"

education in learning a new language or methodology, but the real value comes from watching, doing, talking it over and trying it again. In today's IS organizations, how teams learn is every bit as important as how individuals learn. You wouldn't know it, however, from looking at the typical training budget.

The only possible confession to draw from this is that the overwhelming majority of IS education and training programs are a waste of time and money. Cutting the training budget and the support seminars would be a healthy start. The better investment is to be more introspective: Look at how learning already takes place and leverage that better. Turn group reviews into explorations of alternative programming approaches. Explore how to bring master programmers on board for six months to a year or partner with a local university.

In other words, companies that care about learning have to stop investing in training and start investing in environments where their people can, imitate and discuss better — not best — practices. Let's have the decency and sense to learn from our imitating mistakes.

Schrage is a research associate at the MIT Sloan School and the MIT Media Lab. He is also the author of *So Slow Training: Mastering the Immersion in IT Training Collaboration*. His E-mail address is [schrage@media.mit.edu](mailto:schrage@media.mit.edu).

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## 'PowerPCBooks' may sweep desktops clean

By Lisa Picard

It is not unusual for Macintosh shops to have a stash of PowerBooks that workers can take on the road. But more large shops are looking at mobile Macs as permanent replacements for older desktop systems.

Apple Computer, Inc.'s forthcoming PowerPC-based PowerBooks are expected to encourage that trend, users said.

Due out late this summer, the crop of PowerBooks based on the PowerPC 603e chip are expected to catch users' attention because they are significantly faster than current PowerBooks and even offer performance comparable to that of some desktop Macintosh models.

The notebooks will come in 75-, 95- and 100-MHz versions. Their design will be similar to Apple's popular PowerBook 500 family, according to sources briefed on Apple's plans.

Apple declined to provide details on the new PowerBooks.

Analysts said the trend of notebooks replacing desktop systems is already underway.

"Incrementally, notebooks are gaining share over the desktops," said Kimball Brown, vice president and chief analyst at Dataquest, Inc.'s Mobile Computing group in San Jose, Calif. Notebooks now have about a 16% share of the desktop market, Brown said, a percentage he expects will climb to 30% in the next decade.

Bob Anderson, a senior analyst at A. O. Smith, an automotive products company in Milwaukee with more than 700 Macintoshes and about 80 PowerBooks, plans to order about 40 more PowerBooks this year. More than half of those will replace older Macintosh desktop systems.

"It isn't that [our users] need much more horsepower than what is available in a [Motorola, Inc. 68040] chip, but once they hear these new systems are coming, they want them. And since they have to use them for the next three years, they want to feel they are getting the most power," Anderson said.

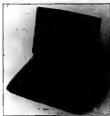
Nutmeg Mills, Inc., a manufacturer of clothing for professional sports organizations, is eagerly awaiting the arrival of the PowerPC PowerBook. The Tampa, Fla., company, which has more than 300 Macintoshes, equipped its sales force with 50 PowerBooks two years ago. Nutmeg plans to replace those PowerBooks with PowerPC models as soon as they are available, according to Mark Beeghly, a systems analyst at Nutmeg.

"We use the PowerBooks to display the graphics and art for the team logos," Beeghly said. "For each team we often have about nine logos, and if you multiply that by the number of teams in each professional sport, it is in the thousands. And you can't carry all your clothing samples with you."

Others agree that a powerful portable alternative is an attractive proposition.

"The convenience and accessibility of being able to work from home or on the road is important, and that becomes more of a possibility when you put a PowerPC chip in a laptop," said John Papa, a partner at The Cusum Group, a financial consultancy in New York that has 90 Macintoshes and 10 PowerBooks.

"We have a lot of people that are married and starting families and have to commute from Connecticut or New Jersey, and if we could make their lives easier so they could sometimes stay home and work, that would be nice."



PowerPC PowerBooks due this summer will resemble the current 500 series.

## Notebook offers 'peak' performance

On Mt. Everest, April Fool's Day brought a tent-destroying storm, and Easter dinner featured yak steak. Since embarking on their adventure March 1, Steve Reesker and the American '95 Everest Expedition [CW, Jan. 30] have communicated each news to the world by sending faxes via notebook computer and satellite. Reesker says such communication presents a challenge:

"It takes a long time to prepare a single computer-generated fax. First you have to warm up the computer to prevent hard drive failure and avoid erasing the LCD panel display which is glazed and frozen each morning," he said. It takes about 35 minutes to reach 55 degrees. "The lithium-ion batteries... are charging fine with the solar chargers. The Dell Latitude [XP] laptops and lithium-ion batteries are working very well at 17,000 feet—even though the specification indicate a maximum altitude performance of 10,000 feet."

"After the fax is written, it is printed out on a Citizen PW90 printer. From here it is fed into an NEC fax which is connected to an NEC satellite up-link. The manual transmission takes about two minutes per page rather than the computer-generated fax transmissions, which take about four minutes per page."

Meanwhile, another expedition will carry Compaq Computer Corp. LITE Elite to Everest to help halt weather patterns and study the environmental impact of previous Everest expeditions. Compaq will give weekly updates on the team's progress on its home page: <http://www.compaq.com>.

—Michael Fitzgerald



Steve Reesker, director of CS at the Eastern Municipal Water District in San Jacinto, Calif., trained for Mt. Everest on California peaks.

## Lotus rewrites word processor

By William Brandel

Lotus took the first step toward reinventing itself on the desktop last week by introducing a rewritten and renamed version of its word processor.

Dubbed Word Pro, the application will replace Ami Pro as Lotus' word processor. The product also represents Lotus' first desktop application to be based on the company's common code strategy. That strategy is intended to help Lotus deliver applications that run on Microsoft Corp.'s Windows and Windows 95 and IBM's OS/2 platforms running on a 95% same-common code engine.

### Suite shortfall

Word Pro also represents what may be Lotus' last chance to change the dynamics of the desktop applications market. Ami Pro is widely viewed as a drag on Lotus' applications suite sales.

Ami Pro is the No. 3 word processor in the market, having posted in less than 2% of the \$614 million in revenue in the worldwide stand-alone word processor market in 1994, according to Dataquest, Inc., a San Jose, Calif., market researcher. Similarly, Lotus' SmartSuite has fallen into third place behind the revamped PerfectOffice suite from Word-

Lotus, page 44



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## Price cuts on notebooks

Several prominent vendors have recently cut prices. Prices for certain models are listed below:

Model	Hard drive	Old Price	New Price
<b>Toshiba America Information Systems, Inc.</b>			
T4600CT D14/75	500M bytes	\$4,940	\$4,499
T4650CT D14/75	772M bytes	\$5,699	\$4,840
<b>Satellite</b>			
T5050CT D14/50	200M bytes	\$2,499	\$2,099
T5060CT D14/50	320M bytes	\$2,699	\$2,299
<b>IBM PC Co.</b>			
755C D14/50	340M bytes	\$3,549	\$3,099
755CSE D14/100	340M bytes	\$4,599	\$4,099
755C D14/100	340M bytes	\$5,599	\$4,999
755C D14/100	540M bytes	\$7,049	\$6,349
<b>Zenith Data Systems</b>			
Z-Noteflex D14/50	340M bytes	\$4,249	\$3,750
Z-Noteflex D14/75	500M bytes	\$5,139	\$4,550
Z-Noteflex D14/100	800M bytes	\$5,859	\$5,400
<b>Permanix PC Co.</b>			
V41 D14/50	260M bytes	\$3,999	\$3,499
V41 D14/100	450M bytes	\$4,999	\$4,499
V41 Pentium	680M bytes	\$8,399	\$7,799

# Digital faces challenging climb to reach PC heights

## Move from No. 13 to No. 11 gets attention

By Neal Weinberg

Digital Equipment Corp.'s PC unit may end up replacing its "Top 5 in '95" slogan with "Top 5 in '95" slogan when "Top 5" is not sure when.

Starting from just about nowhere, Digital nudged up 100% in revenues in unit sales in each of the past three years, and with that type of momentum, the company publicly stated a goal of reaching the Top 5 by year's end.

But Digital is discovering how difficult it is to sustain that rising rate of unit growth, and it is also realizing that the competition is quite a bit tougher at the higher echelons of the fiercely combative PC market. Digital did gain market share in 1994, moving from 1.3% to 2.1%, but it only advanced from No. 13 to No. 11 in worldwide unit

sales, according to Dataquest, Inc. in San Jose, Calif.

Jonathan Enrie, an analyst at Edmunds in Hollis, N.H., said Digital has quietly swallowed its "Top 5" talk. He added that the company is doing an excellent job with its PC business. But, "you've got to remember how good Compaq and HP and Apple and Packard Bell really are," he said.

Dataquest analyst Robert Corpus said Digital has been identified as one of the three hot PC players to watch in 1995, but the other two are Hewlett-Packard Co. and Acer, Inc., ranked six and eight, respectively. So, Digital will have a hard time making a significant move up the chain, he said.

Still, Corpus said Digital is doing the right things to improve its position. The company has expanded its PC line to include notebook computers and servers, has aired eye-catching television ads and is using its networking expertise to offer "total solutions to Fortune 500 companies."

### Service with a smile

John Burns, manager of information technology at Douglas & Lemmon Co., a Farmington Hills, Mich., company that makes seats for the automobile industry, has 145 Digital PCs and is looking to buy another 100 during the next year.

Burns has Digital VAXs and uses Digital's Pathworks software to network the system. One factor in Digital's favor is its three-year warranty, including one-year on-site for all PCs, he said.

Bob McAllister, head operator at Raleigh Federal Savings Bank in Raleigh, N.C., used to buy PCs from a bunch of different vendors, including IBM and Acer.

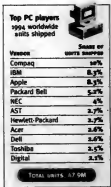
As a heavy VAX shop, the bank now buys only Digital PCs. "It's simpler to go with one company," McAllister explained. He said he is especially impressed with the level of service from Digital. "You call, and they're here within four hours."

In the past couple of weeks, Digital has slashed prices on some PCs by about 19%. It has demonstrated a determination to keep up with the competition and an ability to maintain profit margins by squeezing some efficiencies out of the production process, Corpus said.

Lower prices are an added bonus for Idaho Falls School District

No. 81, which has been buying Digital 486-based PCs exclusively for the past year, according to John A. Christensen, supervisor of computer services.

"We've bought other PCs in the



Source: Dataquest, Inc., San Jose, Calif.

# Wang/Microsoft deal no big deal

By Stuart J. Johnson

The most immediate result of Microsoft Corp.'s recently announced \$60 million investment in Wang Laboratories, Inc. may be that it has cleared the title on ownership of its OLE technology.

In the longer term, however, the software giant plans to incorporate proprietary Wang imaging technology into its systems, server and tools offerings. It will begin with the integration of some functions into Windows 95 by year's end, said Mike Maples, executive vice president of products [CW, April 17].

The company will also release by year's end custom controls for imaging and workflow management. And it will offer a specification codeveloped with Wang for programming interfaces that will be incorporated into Microsoft's Exchange messaging server and Wang's OpenImage and OpenWorkflow products.

### Blaise attitude

However, at least some users and observers said the Wang/Microsoft venture just constitutes the addition of another technology into the Windows 95 mix.

"From the developer's perspective, all these new [features] are nice, but it comes down to the day-to-day reality of 'Do I have time to learn this, too?'" said Matt Pietrek, author of Windows Internals and the forthcoming Speaking Windows 95.

The new imaging features "would be nice, but it's not something that we would use much," said Don Barker, associate professor of information sciences at Gonzaga University in Spokane, Wash. Barker is responsible for about 80 PCs in the university's business school. The school already uses a different imaging tech-

nology, and right now he sees little reason to switch.

"For us, [it] doesn't make a lot of difference [because] the image is just another piece of data," said Arthur Tsai, chief information officer at a major nonprofit institution on the East Coast that recently developed a large image database of textile fibers.

Other users contacted by Computerworld

Time frames

Microsoft's investment in Wang will help the software giant incorporate advanced imaging technologies into its systems and add special interfaces to the messaging server over time

Wang imaging and OpenWorkflow

- incorporated into Windows 95 by year's end
- imaging controls for development tools by year's end

Programming interfaces for Exchange, OpenImage and OpenWorkflow

- Specified by year's end
- incorporated in a second release of Exchange (no date set)
- incorporated into Wang OpenImage and OpenWorkflow (no date set)

have not yet evaluated the potential impact.

Wang had used Microsoft for alleged patent infringement nearly two years ago over technology incorporated into OLE.

OLE lets users link or embed data from one application into another. Linking enables changes in source data in the first application to be immediately reflected in the second.

The case had not come to trial when Microsoft agreed to settle.

past. Some we were happy with, and some we were not very happy with," Christiansen said. "Over the last year, we've been very happy with the DEC PCs."

### You get what you pay for

He conceded that he could have saved \$100 to \$150 per unit by going with a lower-priced vendor, but he has found that "staying with the same vendor is just cost-effective when you consider the cost of ownership and the fact that we've got a hardware program in place with Digital."

Skip Gladfelter, vice president of Americans marketing for Digital's PC business unit, said the latest price cuts were primarily aimed at reducing the inventory of lower-end, 486-based models.

He said Digital wants to focus on Intel Corp. Pentium-based PCs and is shifting its product mix to faster processors and larger hard drives.

Gladfelter conceded that Digital will be hard-pressed to maintain its current growth rate. He is shooting for growth PC sales growth in the 15% to 20% range, segmented by increases in three relatively new areas for Digital: consumer sales, notebooks and PC servers.

He said hitting the Top 5 this year was a long shot but added that "not one person has given up on it."

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Plug and Play goes a long way toward

eliminating disruptions for you and your users. Windows 95 recognizes changes made to hardware and reconfigures itself, without rebooting. Even systems that need reconfiguration regularly can be managed automatically. Plug a notebook PC into a docking station and the system automatically adjusts all new settings. Mobile users can change PCMCIA cards as easily as, well, changing cards.

#### **Take a Shortcut**

Windows 95 allows users to create shortcuts in the tangled world of the network. Once a resource is located, they simply create a desktop icon and in one

click they're there. Create a simple, intuitive desktop that gives users one-step access to resources they use all day. Shortcuts can then be e-mailed between users without burdening the network and server with multiple copies of routed documents. Users can even drag a shortcut from the upcoming Microsoft Network online service.

#### **Remote Possibilities**

Dial-up Networking (remote access services) lets users on the road connect quickly and easily to frequently used networks. Desktop layouts of mobile computers look exactly like the PCs in the office, including shortcuts. And every time a person connects to or disconnects from the network, selected files can be automatically updated. Microsoft Exchange offers remote, as well as on-site users, a one-stop location for viewing and working with all types of information, from electronic mail and faxes to documents and public folders.

#### **For a Closer Look**

Look no further than WinNews. It's the on-line, electronic newsletter that updates you with the latest information about making the move to the upcoming Windows 95. To subscribe to WinNews, e-mail us at [enews9@microsoft.nwnet.com](mailto:enews9@microsoft.nwnet.com) with only the words **Subscribe WinNews** in the text of your message.



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\* Source: Usability Sciences Study, October, 1994

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## Lotus

CONTINUED FROM PAGE 39

Perfect, the Novell, Inc. Applications Group. PerfectOffice began shipping in late December last year.

Many view the Word Pro launch as a must-win situation for Lotus.

"This is their last shot at being a player in this market," said Bob Flanagan, di-

rector of the workgroup service at The Yankee Group, a Boston consultancy. "If it is not accepted, all of Lotus' desktop applications will be seen as also-runs."

However, early indications are that Lotus now has a word processor that will stay up with the pack. Word Pro is packed with 1,500 new features to put it in par with Microsoft's Word and Novell's WordPerfect, according to analysts.

For example, Word Pro includes tools that enable users to embed tables or ob-

jects into a document in a much more productive way than in Ami Pro. When a user embeds and clicks on part of a 1-2-3 range in a Word Pro document, the menu at the top of the screen changes to the 1-2-3 menu. When the user clicks outside the range, it changes back to Word Pro.

The product also provides seamless file formatting with current and past versions of Word and Novell's WordPerfect files.

"They have finally included the same major features as the other word process-

ors," said Greg Kozak, a consultant and Word Pro beta tester at Hewlett Associates, a consultancy in Lincolnshire, Ill. This will make it easier for users to justify buying it, he said.

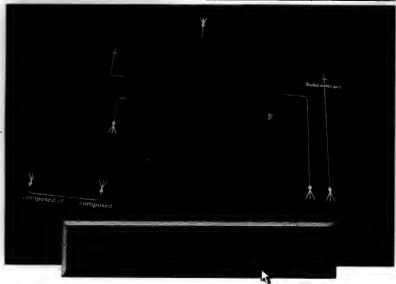
"For a large site, it will be a heck of a lot easier to move end users from one of the other word processors into the new Lotus application," Kozak said.

Some Word Pro features set it apart from the pack. For example, it includes versioning technology, which originally debuted in Lotus 1-2-3 for Windows Version 4.0. This technology enables users to store edited versions of the same document in a single file. This not only saves disk storage space but enables the viewer to see which changes were made at what time.

Word Pro also includes the following features:

- **Document control tools** that allow the document author to control who can access or change documents.
- **SmartMaster templates** that ship with the product and can be easily built by the user.
- **SmartControls** that allow the user to break the document into modules, which are then marked by tabs at the top of the screen. For example, one module could be the memo and address, another could be the greeting, and another could be the body of letter. By clicking on the tab, "body," the cursor will take the user to the part of the document where the body of the letter would start.

The first version of Word Pro will ship this summer and run on 16-bit Windows. Versions for 32-bit Windows 95 and OS/2 will soon follow, Lotus officials said.



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## Monitors never looked so thin

By Rich Galt

TOKYO

NEC Corp. later this year will begin shipping two large-format LCD screens designed to supplant desktop monitors, a company spokesman said.

The units, measuring 12.1 inches and 15 inches, are equipped with NEC's full-color, thin-film transistor LCD technology — similar to what high-end notebook users use — that enables them to display 16 million colors.

They also sport features found on traditional CRTs, including the same viewing area as a standard 15-in. monitor and a multiresize/enlargement function, NEC said. The units are compatible with PCs and workstations.

The 13-in. unit features 1,280- by 1,024-pixel resolution, and the 12.1-in. unit sports 684- by 768-pixel resolution. The screens are 9.61-inch thick and roughly 30% lighter than similar-size screens, the NEC spokesman said.

NEC said the units will be marketed by hardware makers as stand-alone desktop units. Pricing has not been set.

Galt is a Tokyo correspondent at the IDG News Service.

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# What good is a *data warehouse* without the keys to *unlock* it?

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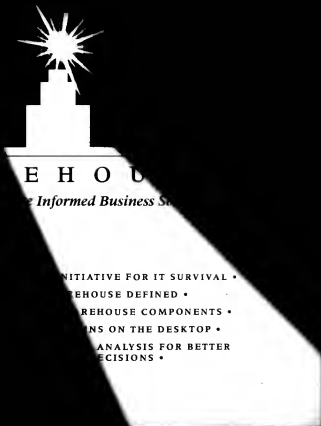


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DBTA Group, February 1994 Client Survey

44 More than 90 percent of our Fortune 2000 clients indicate they will be pursuing a data warehouse strategy in the next three years. 99

Why is data warehousing a key technology for dynamic organizations? Quite simply, it's the easiest way to get information into the hands of people who need it—without disturbing production data while they use it.

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U.S.A. Issues, "Building the Data Warehouse"

44 In the data warehouse environment, the question is not whether...data will be partitioned but how...data will be partitioned. 99

Partitioned data allows users to do parallel sorts, scans, joins, loads/unloads, back ups, and restores faster and easier—all critical functions in a data warehouse environment.

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# A Mandatory Initiative for SURVIVAL

By Aaron Zornes

IT organizations are under tremendous pressure to provide better quality decision-making information in forms easy to access and manipulate. Business users are reacting to their own mission-critical needs for better information due to rapidly changing, increasingly volatile and competitive markets, as well as ever-shrinking product life cycles.

A 1994 survey of IT managers at Fortune 2000 enterprises by META Group found that more than 90% were planning to implement data warehouses between 1994 and 1996. With shrinking IT budgets, the impetus for implementing a data warehouse comes either from line-of-business management, who are championing these next-generation decision support systems, or from IT organizations who believe the investment will provide major, demonstrable near-term payback. META Group believes it is both.

Why is data warehouse one of the hottest industry trends? Simply stated, enterprises must become more competitive and get closer to their customers to survive. Unfortunately, much of the data maintained by enterprises about their customers is locked up in data "silos" — databases which have evolved as discrete independent subsystems. These databases are unable to provide the enterprise a consolidated view of who the customer is, or even what services and products are correlated across the customer base.

The data warehouse is a blend of technologies, including relational and multidimensional analysis, client/server architecture, graphical user interfaces, powerful meta data modeling and more. These technologies combine to enable the integration of multiple operational databases into a single database designed specifically for analytical processing, such as decision support. The resultant "subject-oriented database" is designed with end-user access in mind.

The business value of data warehouses can be summarized as follows:

- **More cost-effective decision making.** The elimination of staff and computer resources required to support ad hoc inquiry and reporting against operational/production databases offers significant savings.

This also eliminates the so-called "MIP-obstruction" factor of executing long-running, complex queries against production databases designed specifically for short, simple transactions. Profitability analysis is also a key benefit of being able to correlate combinations of products and services with marketing initiatives and external on-line business demographic databases.

- **Better business intelligence.** Increased quality and flexibility of market analysis arises from multi-tiered data structures which may range from detailed, transactional level to high-level summary. This bypasses application-specific databases, which foster distrust because of their differing versions of the truth. The ability to discern "how many" of "which products" are actually sold into a given household address is key to identifying cross-marketing opportunities.

- **Enhanced customer service.** A total customer relationship can be established if all customer information is correlated via a single data warehouse.

- **Enhanced asset/liability management.** Purchasing agents and other financial managers would benefit greatly if they could ascertain the big picture of enterprise-wide purchasing and inventory patterns. In doing so, the financial managers often discover cost savings hidden in redundant inventory, as well as previously unknown volume discount opportunities.

- **Business process reengineering.** Providing business users unlimited analysis of their business information often provides insights into the work processes themselves, which will yield breakthrough ideas for the reengineering of those business processes.

- **Alignment with corporate downsizing objectives.** Distributed decision support is increasingly mandated by enterprise rightsizing as organizational restructuring further distributes decision-making responsibility.

Throughout 1995 and 1996, META Group analysts believe the majority of corporate IT organizations will reengineer systems via data warehouse architectures and initiatives, in combination with relational databases and multidimensional on-line analytical processing. Whether by providing marketing insights, opportunities for cost savings or volume discounts, data warehouses provide an IT component that is increasingly critical for supporting the tempo of business competition. ■

*Zornes, an international authority on data warehousing, is senior vice president for Application Development Strategies at META Group, a leading retailer-based IT consultancy based in Stamford, Conn. He has worked with numerous Fortune 2000 IT organizations in the architecture, design and implementation of their corporate data warehouses, and has spoken on data warehousing at major IT conferences around the world.*

# DATA WAREHOUSE

D E F I N E D

By W. H. Inmon

**T**he movement away from the classical legacy application environment to the informational enabling, data warehouse-centric environment is inevitable. The inadequacies of the legacy environment are such that the question is not whether an organization will move to the new information paradigm — but when.

With this movement comes the question: What exactly is a data warehouse environment and how does it work?

The data warehouse is designed to serve the information needs of the entire organization. To accomplish this, it stores data at different levels of granularity — from current detail data to highly summarized data. As a rule, the more current the data, the more immediate its use. Typically, current detail data supports day-in-day decisions, while historical data supports trend analysis and long-term decisions.

One of the requirements of the data warehouse environment is the ability to accumulate and manage large amounts of data. Therefore, it is important to properly choose levels of granularity and summarization for the data in the warehouse. Other design approaches and techniques to consider for managing large amounts of data in the warehouse include: storing data on multiple storage media, summarizing data when detail becomes obsolete, storing data relationships in terms of artifacts, encoding and referencing data where appropriate, and partitioning data for independent management and indexing.

What follows is a primer on the role of each of the structural elements that make up a data warehouse architecture (see figure on page DW6):

- **Current detail.** The current detail of the data warehouse environment is the heart of the data. It is the place

where the bulk of the data resides, and it is often stored on a parallel processor. Current detail data is fed directly from the operational, legacy environment, and it represents the entire corporation, not a given application. Current detail data is organized along subject lines.

Every unit of data in the current detail can be thought of as a snapshot, where one unit of time identifies the moment at which the snapshot is accurate. Current detail represents the lowest level of granularity of data found in the data warehouse environment. It may be stored as raw data or as a profile — which represents an aggregation of raw data. Current detail is typically two to five years old. It is refreshed as frequently as required by the environment, be it daily, weekly or monthly.

- **Old detail.** The old level of detail is where archival

data, or data typically older than two years, is stored. There is usually a massive amount of data stored at the old detail level and a low probability of access. Old detail is at the same level of granularity as current detail. Data can be aggregated or profiled in order to condense it as it enters the old level of detail. Old detail typically contains many versions of the same data structure, because the data structure changes over time. It can be stored on a variety of media.

- **Departmental/data mart.** Lightly summarized data is the hallmark of the departmental element of the data warehouse. The departmental level is customized to suit the needs of the department owning the data. The

customization is done as the data passes from current detail to the departmental level; the departmental level is fed exclusively by current detail. There is much less data in any given departmental database than there is in current detail. The departmental level contains both detail and summary data. The process of summarization as the data passes into the departmental level is an important piece of meta process. The departmental level of data comfortably uses relational technology to perform multidimensional analysis.

- **Highly summarized data.** The highly summarized level of data in the data warehouse environment is

*Inmon, co-founder and executive vice president of technology at Prism Solutions, based in Sunnyvale, Calif., is credited as the father of the data warehouse concept. He has more than 25 years' experience in database technology management and data warehouse design, and has spoken at computing conferences around the world on developing data warehouses.*

designed for executive management, and should allow access of increasing levels of detail through a drill-down process. The highly summarized data comes from either the departmental level of data or the current detail level. The data volume found here is much less than at other data warehouse levels, and represents an eclectic collection, supporting a wide variety of needs and interests.

- **System of record.** In the initial stages of building a data warehouse, the system of record is data found in the applications which feeds and supports the data warehouse. The system of record should always represent the "best" data that a corporation has, where "best" is defined as data that is the most timely, complete and accurate, has the best structural conformance to the integrated data model, and resides the closest to the source of entry into the operational environment. The system of record data is by no means perfect, though. As it passes into the data warehouse, it undergoes significant editing, cleansing and reformatting.

- **Integration/transformation programs.** As data passes from the system of record into the data warehouse, it travels through a set of integration and trans-

formation programs, which turn application-specific data into corporate data. These programs perform functions such as reformatting, recalculating, modifying key structures, adding time elements, identifying default values, supplying logic to choose between multiple data sources, summarizing, tallying, and merging data from multiple sources. The integration and transformation programs need to be modified each time the operational environment or the data warehouse environment changes.

The final element of the data warehouse environment is meta data — or data about data. It resides at all levels of data within the data warehouse, but exists and operates in a different dimension than does other warehouse data. For this reason, meta data is often taken for granted and/or misunderstood.

Meta data is one of the most important aspects of the data warehouse environment. It exists at both warehouse development and end-user application levels. Meta data is used by the data warehouse developer to manage and control data warehouse creation and maintenance. For end users, meta data resides on the data warehouse platform itself and is available as a regular part of the access and analysis of the warehouse.

**Balancing end-user needs  
and IS control is hard enough  
without some software tool  
putting its own spin  
on your data access...**



## UNDERSTANDING

## Meta Data's Key Role

Meta data is very much an integral, vital part of today's information environment. To understand why, consider the following example. You go home and your teenager asks for help on a school report on early Native American life in New Mexico. You know little on the topic so, teenager in tow, you head for the library to find relevant books. You go straight to the on-line card catalog because looking sequentially through the stacks would take too long.

Like the library, your corporation is large, complex and filled with information types. Suppose you are asked by your boss for a report that analyzes product cost vs. revenue for your five top product lines over the past five years. In addition, your boss wants you to factor in competitive announcements and economic conditions. Where do you start?

To enable your company to become a first-class information organization, you need a corporate card catalog, and it is meta data that fulfills this need. Changes in the world of information systems have made meta data much more critical today than it was in the past. The increasing size of information systems has fueled much of the need for organizing data efficiently so it can be located quickly. Additionally, in years past the IT world consisted only of operational processing and operational data. Today, with the addition of informational processing and informational data, the world has

become infinitely more complex.

In the past, the user of meta data was the IT professional, who was technologically proficient in gaining access to this data. Today, the primary user is typically a decision maker, who is first a business person, and second a technician — if at all. As a result, the decision maker needs as much technical support as possible and comes to depend on the meta data "card catalog" as the tool of choice.

Time is another dimension of information processing that makes meta data management mandatory. It is typical to contain five to 10 years of data in the data warehouse, unlike the operational environment which contains almost exclusively very current data — typically 60 to 90 days old.

What are the implications of storing a lengthy time period of data such as that found in the data warehouse? The first is that the volume of data will be large;

the second is that the structure of data will change over time. How a customer or product file is defined today will not be how it is defined in 10 years. As long as the business is growing and thriving, its information structure will change.

Over a 10-year period, many structural changes will take place, and it is meta data that will track these changes. The corporate card catalog acts as the container for storing the history of changes in meta data.

## TOOLS MEET THE CHALLENGE

As the importance of meta data has grown, so too have vendors' responses with greatly enhanced tools for managing meta data. In years past, meta data management tools centered around data dictionaries and repositories. Using modern meta data management

## CLASSICAL DATA WAREHOUSE STRUCTURE



tools, the data warehouse development process is tightly integrated with meta data management. In fact, using some vendors' tools, meta data management and warehouse development become one and the same, eliminating the need to cost justify a separate project.

As the developer builds the data warehouse, he or she is not aware that anything special is happening with meta data. Once the data warehouse is completed, however, meta data automatically becomes available to end users. By marrying the development environment to the meta data management environment, a handful of important goals are accomplished. These goals include the automatic, accurate and complete capture of meta data. Keeping meta data current also becomes automatic. In short, the modern tools have made the promise of meta data a reality.

To realize this promise, meta data management for the data warehouse environment has some unique requirements. There are distinct types of meta data that should not be mixed in the data warehouse environment because they serve different purposes.

**TO ENABLE YOUR  
COMPANY TO BECOME  
A FIRST-CLASS  
INFORMATION  
ORGANIZATION, YOU  
NEED A CORPORATE  
CARD CATALOG, AND IT  
IS META DATA THAT  
FULFILLS THIS NEED.**

## DATA WAREHOUSING

Development meta data resides outside the data warehouse and is used by developers to create and maintain data warehouses. Requirements include the following:

- Meta data must be versioned to capture its changing history

- The structure and content of the data warehouse needs to be stored

- The system of record (or source, usually the legacy applications) for the data warehouse needs to be clearly and formally identified

- The integration and transformation logic that moves the data from the operational environment to the data warehouse environment must be made available as a regular part of the data warehouse meta data

- The history of refreshment needs to be stored as a part of the meta data so the end user knows the currency of the data

- Metrics need to be stored so the end user can determine whether a request will be a large or small one before the request is submitted.

End-user application meta data resides in the data warehouse and is used as a dynamic link between the data warehouse and end-user applications. Some meta data can be made directly available to the end

user, such as information about the original source of the data in the warehouse. Business terms, in addition to systems terms, need to be available to the end user for this purpose. Other meta data is used by applications to form intelligent queries and contain analytic rules. The various forms of meta data should include the following:

- Location and description of data warehouse servers, databases, tables, names and summarizations

- Rules for automatic drill up, down and across business dimension hierarchies, like products, markets and charts of accounts

- End-user defined custom names or aliases for the more technically named data headings and facts

- Rules for end-user defined custom calculations

- Personal, workgroup and enterprise security for viewing, changing and distributing custom summarizations, calculations and other end-user analytics

- Descriptions of original data sources and transformations.

In summary, meta data management is key to a corporation's successful use of its data warehouse environment. The more it is understood and its role appreciated, the more corporate value it will yield. ■



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## DHL Worldwide Makes Warehousing Work



DHL Worldwide moved to a data warehouse environment to house an integrated information system that would satisfy its need for faster, more flexible data delivery.

**DHL** Worldwide Express, the world's leading international express delivery service, moves hundreds of thousands of packages through 14 major international hubs every day, servicing customers in more than 220 countries. That makes data management a critical issue for DHL.

Adding to the challenge is the fact that DHL operates as a completely decentralized organization. Operations in each of its regions and countries are independent and each implement their own IT services based on global standards and infrastructure.

This decentralized data environment made worldwide reporting and analysis a challenge. Files from 188 costing areas in a variety of formats had to be painstakingly reconciled and merged to build a single view of all the information.

In addition, corporate customers depend on DHL to track their costs and service levels, because the diffusion of shipping activity across offices and departments makes it difficult for them to do so on their own. Customers expect DHL to be able to give them a precise accounting of

how they've spent their money and what they've received in return.

But without a data warehouse, that type of report was the one package DHL couldn't easily deliver overnight.

### PUTTING IT TOGETHER

Impetus for the warehousing project was initially created by a request for an integrated information system at DHL's Worldwide Coordination Centre in Brussels, Belgium. Discussions with users pointed up the diverse ways different people wanted to correlate and view data. Both this need to slice data in different ways and the fact that the global IT team couldn't dictate any changes in the way each region and country ran its own operations led to the decision to build a data warehouse.

"We had to take the data as it was provided to us and work with that," says Dee Copelan, a member of the team that spearheaded the data warehousing project at DHL Systems in Burlingame, Calif. Copelan found that bringing in business managers added an extra dimension to the project. "They were the ones who

would look beyond the way things were and tell us what they'd really like to see," she says.

Copelan cautions against the urge to do too much, though. "We originally planned to integrate data from five applications into the warehouse," she says, adding that they eventually scaled the first phase down to two applications. Copelan says that the integration of data from the two applications — marketing and costing — provided plenty of benefits.

She also feels confident that the flexibility of DHL's data warehousing approach will let them add other data sources incrementally as required. "With a data warehouse, it's more important to show results quickly and then respond to user feedback," she says. Copelan sees data warehousing as providing useful diagnostics because it helps make data logically consistent. "It really highlights problems in the corporate information environment, such as when different groups define terms differently," she says.

For DHL, data warehousing means that reports based on data from worldwide operations can now be generated in hours instead of days. And since users don't have to spend their time cleaning up data and managing files, they can now address the kind of in-depth business analysis that delivers real value to the organization. What it means for DHL is that it can now better correlate information about cost and revenue variables in different countries and take appropriate action.

Perhaps most importantly, global account managers can now present their customers and prospects with accurate, good-looking reports in a timely fashion. "That ability alone goes a long way to justifying the cost of the project," says Copelan. "We've provided a new marketing tool to help DHL land and keep the global customers we're targeting." ■



## DEMYSTIFYING

## Warehouse Components

By Colin White

End users today need to be able to easily access and analyze corporate data for business decision making. One approach that is gaining increasing acceptance is a data warehousing system in which business users are given access to an integrated informational warehouse database. This data warehousing system is constructed by extracting and integrating data from existing operational systems as well as from external information providers.

To be successful, a data warehousing system must be easy to set up, manage and use. It is important, therefore, to understand its objectives and requirements, and determine how well vendor products satisfy the needs of data warehouse designers, administrators and business users.

The key components of a data warehousing system (see figure on page DW12) include the following:

- Definition component for defining and setting up the data warehouse environment
- Data acquisition component for copying data from source files and databases to data warehouse databases
- Management component for managing data warehouse operations
- Data distribution component for exporting warehouse data to external systems
- Information directory component for providing information about the data stored in warehouse databases
- DBMS component for managing, maintaining and accessing warehouse data
- Data access and analysis component for providing business end users with the tools they need for accessing and analyzing warehouse data.

## DEFINITION COMPONENT

The definition component is used by warehouse designers and administrators to: a) design and define the data warehouse databases, b) define the data sources from which the warehouse data will be obtained, and c) specify the rules that define the data cleanup and enhancement to be done when copying data from source systems to the data warehouse databases. The output from this component is stored as meta data in the information directory component.

## DATA ACQUISITION COMPONENT

One of the key objectives of a data warehousing system is to put corporate data in a form that the business user can easily understand and use. The data acquisition component does this by extracting data from source systems and cleaning and transforming it, based on the rules defined by the definition component. Cleanup may require the restructuring of records or fields, removal of operational-only data, decoding and translation of field values, the supply of missing field values, or the checking of data integrity and consistency. Transformation may involve adding a time field (if one is not present in the source data) to reflect the currency of data, data summarization or the calculation of derived values. Once the source data has been cleaned and transformed it is mapped to the target warehouse databases, transported to the data warehousing system, and loaded (or updated) into the appropriate warehouse

databases. The loading (or updating) of the warehouse databases is done using SQL (assuming a relational DBMS is being used) or a database load utility.

There are four main types of products that support data acquisition:

- Code generators create tailored data acquisition programs. The objective of these products is to generate tailored JGL copy programs based on the data structure definitions, as well as on the cleanup and transformation rules defined by the definition component. This approach reduces the need for an organization to write its own JGL copy programs, and has the benefit of providing more data transformation power than that provided by generalized copy utilities and data replication tools.

- Data replication tools capture changes to a source database on one system and apply the changes to a

*White is president of DataBase Associates International, an IT consulting firm based in Morgan Hill, Calif., and editor of InfoDB, a technical journal on client/server computing and data warehousing. He is also conference director for DB/EXPO, a national database and client/server exhibition and conference.*

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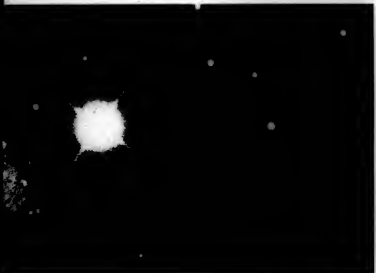
And with Prism Warehouse Manager™ you can extract, inte-



*Whether the data you need to understand today extends back to the beginning of time or last week's sales meeting, use Prism's complete data warehouse solutions to organize and understand your universe of data. So you can make more informed decisions.*

grate and transform operational data into a single, structured source of useful business information for decision support — without going through the time and expense of manually writing programs, or impacting the system's performance.

# EXAMINE YOUR UNIVERSE OF DATA.



*The Years? What Business Assumptions Have Been Made In The Past?*

*To Access And Integrate This Data? How Have Business Definitions And Terms Changed Over*

#### LEADERS RESPOND TO MARKET NEEDS.

Which is why we developed Prism Directory Manager: its customized business views allow you to use it much like a card catalog in a library, dramatically simplifying building, storing, accessing and navigating an integrated directory of the information in your data warehouse. Now, all your users can understand the business assumptions that have been made as data has been collected and changed over time.

#### LEADERS ATTRACT LEADERS.

And leaders from every major industry are already benefiting

from Prism data warehouse solutions. Because Prism offers an open-systems environment, a solid foundation to build client/server applications, an expanded data conversion capability, and excellent customer service. Plus, an architecture that collects and manages data warehouse meta data — information about how the warehouse was built and how you can use it.

#### LEADERS TAKE ACTION.

So call now to find out more about how Prism data warehouse solutions let you make more informed, more intelligent, more reliable business decisions. And we'll send a new audio tape by Bill Inmos, creator

of and foremost expert on data warehouses. He'll tell you all you need to know about data warehousing, and how Prism can help you turn your universe of data into down-to-earth success.

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**PRISM**

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FOR BUSINESS LEADERS**

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copy of the source database on a different system. These replication products rarely support the copying of data from non-relational files and databases, and often do not provide facilities for significant data cleanup and transformation. Replication products can also be used to propagate data changes from a central data warehouse to decentralized warehouse database servers.

- Generalized copy utilities bulk-copy data from a source system to a target system. The focus of these products tends to be on the high-speed transfer of data, rather than on data integration, cleanup and transformation. Rarely are these products appropriate for data warehousing environments where there is a need to integrate and reformat data from multiple nonrelational operational files and databases.

- Database gateways, as a rule, focus on providing workstation end users with access to operational (or data warehouse) databases. This approach is often used as an alternative to building separate data warehouse systems, since it gives the user direct access to operational data. The disadvantages are that the operational data is frequently not in the form the user wants, summaries have to be built on the fly (increasing processing overheads), and historical information is not available. Another disadvantage is that SQL remains the access language used to retrieve data, and this limits the amount of data transformation that can be done during retrieval. In addition, complex SQL manipulation of nonrelational data has poor performance characteristics.

#### A KEY REMIT OF THE INFORMATION DIRECTORY IS THAT IT HELPS BUSINESS USERS UNDERSTAND WHAT INFORMATION EXISTS IN THE WAREHOUSE AND HOW TO ACCESS AND USE IT.

There are many approaches to acquiring data and copying it into a data warehouse system. The direction of the industry is to use a mix of code generators and data application tools.

#### MANAGEMENT COMPONENT

The management component consists of a set of services for use by other warehouse components, and for managing warehouse data collections. A data collection is a set of data of interest to a specific user or group of users. Data collections are derived from the base data created by the data acquisition component. The services provided by the management component include a data maintenance service for deriving new data collections from warehouse base data and a distribution



To be effective, a data warehouse must be easy to set up and use. Vendor support of the above components varies widely, so users must be discerning in their review of product solutions.

service for exporting warehouse data to decentralized warehouse database servers and other end-user decision support systems. The management component also provides services for handling the security, archiving, backup and recovery, and monitoring of base data and data collections. Often these latter services employ the facilities provided by underlying operating system and database software.

#### INFORMATION DIRECTORY COMPONENT

The information directory component of a data warehouse contains information (known as meta data) about the data in the warehouse databases. A key benefit of the information directory is that it helps business users understand what information exists in the warehouse and how to access and use it.

The three main elements of the information directory are the technical directory, the business directory and the information navigator.

The technical directory contains information about warehouse data for use by warehouse designers and administrators. It has information about data sources, targets, cleanup rules, transformation rules and mapping between data sources and the warehouse databases. Most of the information in the technical directory is created when the warehouse designer defines the data sources and targets, as well as the rules to be applied when copying data into the warehouse. It may also be imported from an external system, such as a 3GL copybook library, DBMS system catalog or CASE tool.

Information about the amount of data in the warehouse and the date it was created or updated should also be stored in the directory. Ideally, this information should be collected by the tools employed to acquire data from the source systems and delivered to the warehouse databases. Information about how end users access and use warehouse data should also be trapped and added to the technical directory to enable designers and administrators to tune and enhance the

data warehouse.

The business directory contains information that gives end users an easy-to-understand view of the data in the warehouse. This information includes:

- The business terms and associated technical names and aliases used to access warehouse data
- The source of warehouse data, derivation rules and currency of the data
- Contact information about the owner of the data
- Details about predefined queries and reports
- Authorization requirements.

This business information is usually created by the warehouse administrator, but it may also be imported from external systems, such as a CASE tool, or a query and report writing tool.

The information navigator provides end users with easy access to the business directory and warehouse data. The navigator should provide the following:

- A query and navigation facility to access and drill down through information in the business directory
- The ability to create temporary or permanent warehouse data collections using canned queries or by building new queries via an access assistant.
- A communications facility to send new data acquisition requests to the warehouse administrator
- A facility to send a request to the data distribution component to export an existing warehouse data collection to another data warehouse or external system
- A seamless interface to the data distribution and data access components.

To date, vendor support of the three components of the information directory has been limited. Some major developments in this area are under way, though, which will become available to users this year.

As data warehousing use grows, an integrated information directory facility with a business directory and associated information navigators will become essential for end users to fully exploit the data warehouse's power. This capability will become a key distinguishing factor between data warehousing products.

#### DBMS COMPONENT

The DBMS component consists of the database software used to maintain and retrieve warehouse data. Two key considerations when choosing a database product for a data warehousing system are scalability and performance. Once the value of the warehouse is recognized, the warehouse databases tend to grow very quickly, making it critical that the DBMS be highly scalable. And since the warehouse databases can involve many gigabytes of data, the database products must be able to provide fast performance when processing data in these very large databases.

To solve performance problems when loading, accessing and analyzing large amounts of data, vendors are introducing parallel processing database products that exploit the huge amounts of computing power provided by symmetric multiprocessor and massively

parallel computer systems. Of key importance here is the ability of the database product to process queries in parallel, and the availability of utilities that perform database administration tasks such as database loading, backup and recovery, and index building in parallel.

#### DATA ACCESS AND ANALYSIS COMPONENT

Data access and analysis constitutes the remaining data warehouse component. It provides the tools that let users explore and analyze the data warehouse, allowing them to improve decision making and gain competitive advantage. These tools can range from query generation tools to multidimensional products for complex data analysis, to data mining tools that let users drill down through warehouse data.

#### CHOOSING THE RIGHT PRODUCTS

Vendor support of the above components and requirements of a data warehousing system varies widely, and the following list summarizes some key factors that can be used to distinguish between their products. Look for the following:

- Source database and file systems supported
- Target warehouse database systems supported
- Operating platform and GUI supported by definition component
- Data cleanup and transformation capabilities
- Methods used to maintain warehouse databases (data refresh vs. data update; SQL manipulation vs. database load utility)
- Facilities for importing/exporting meta data from/to external sources
- Amount of manual intervention required during data warehouse operation
- Facilities (if any) provided by the information directory, data distribution and management components
- Amount of 3GL code generation (if any) by the data definition component
- Support for database products that provide parallel query and parallel utility operations
- Support for data analysis and data mining tools
- Ability to scale to large numbers of users and large databases.

There is much more to data warehousing than just copying operational data into a separate informational database. A data warehousing system should provide a complete solution for managing the flow of information from existing corporate databases and external sources into end-user decision support systems.

Nor is this enough. Data warehouse tools and facilities must make it easy for business users to find out what information exists in the warehouse and then be able to access and manipulate that information. Without it, the data warehouse developer can build it, but business users will not come. ■

WAREHOUSES TEND  
TO GROW VERY  
QUICKLY, MAKING IT  
CRITICAL THAT THE  
DBMS BE HIGHLY  
SCALABLE.



It seems you can't open a magazine today without reading about the importance of understanding your customers.

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**Global Information  
Solutions**

By Douglas Hackney

**B**oth information technology and marketing managers are often at a loss to measure and monitor return on investment (ROI) for their programs and technologies. Desktop query and reporting tools provide the means for both groups to realize this elusive goal, as well as to improve ongoing programs and processes.

IT organizations have long fought the battle of selling new technologies with only nebulous promises of increased productivity or cost savings. All too often these productivity and efficiency metrics have proven difficult, if not impossible, to quantify. Similarly, marketing organizations have been at a loss to provide ROI evaluations of individual marketing programs.

Modern graphical user interface (GUI) database query and reporting tools have revolutionized access to enterprise information. Properly utilized, these same query and reporting tools are capable of providing both IT and marketing organizations with ROI analysis of their programs.

Most organizations have deployed, or are in the process of developing, data warehouses to improve access to enterprise data resources. They also have implemented GUI query and reporting tools to provide quick and easy access to these new resources. Why then have so few leveraged these assets to deliver the ROI measurement they so earnestly seek?

The answer lies in what I term the "Mandate Gap."

#### THE MANDATE GAP

Between the typical IT organization and the typical marketing organization lies a gulf that extends beyond functional roles. Each has a clearly defined mandate. Unfortunately, the lack of an overall view as to how these differing missions can coexist and cooperate is oftentimes overlooked.

The mandate of IT organizations regarding decision support systems (DSS) is generally regarded as "store and report" the data. This mandate is reflected in the specifications used to evaluate and implement query and reporting tools, which generally call for querying and reporting the data. These two requirements are usually expressed as "increasing the speed of information flow" and "reducing infrastructure (manpower) reporting requirements."

Marketing's mandates, on the other hand, are generally held to be 1) find new business, 2) retain and expand market share, and 3) justify your existence (show ROI for your programs). A query and reporting tool that merely provides data access and reporting may help find new business, but has little impact on marketing's other mandates.

# Quantify

A comprehensive query and reporting tool will accomplish the mandates of both IT and marketing, and provide a method for measuring and improving ROI. To realize these benefits, the tool must fully exploit the three "big wins" of desktop data access and reporting.

#### EXPLOITING THE "BIG WINS"

There are three "big wins" that derive from the use of desktop query and reporting tools:

1. Desktop point-and-click access and reporting of enterprise data. Direct user access to data warehouses leads to many benefits, including reduced IT reporting resources, reduction in cycle time for information flow (users get answers in minutes instead of days or weeks), and better user understanding of enterprise information resources.

2. Returned answer sets are in native desktop form. This allows users to quickly and easily replicate and distribute information among common desktop tools. Data sharing technologies such as Publish and Subscribe on the Macintosh platform and OLE (Object Linking and Embedding) on the Windows platform allow systemic distribution of data globally with the push of a button. This represents powerful capabilities that can revolutionize workflow and cross-functional information exchange.

3. Programs and processes are created, implemented and monitored from the desktop. When users have access to the data and can easily utilize tools to share and analyze it, they quickly transform the raw data into meaningful information. The next direct step is to derive and define the need for programs and processes.

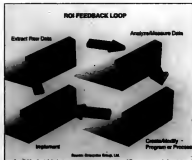
Once these programs and processes are implemented, users find they have the tools and capabilities to monitor them from the desktop. Data integrity processes can be evaluated; marketing programs can be monitored in near real time to determine impact. Feedback is immediate and direct to the desktop.

A COMPREHENSIVE  
QUERY AND REPORTING  
TOOL WILL  
ACCOMPLISH THE  
MANDATES OF BOTH IT  
AND MARKETING.



# ing Gains

It is this ever narrowing focus on the goal that reveals the true power and potential of desktop access to enterprise data. A feedback loop is created (see figure below) in which business metrics are evaluated and a program or process is initiated, which drives a delta in business metrics. The delta is then evaluated, the program or process is improved, the metrics are evaluated again, and so on.



It is only upon full implementation of the third "big win" that ROI measurement of technologies and programs becomes possible. Full implementation requires specific, robust capabilities, which include the following:

- Accessible, timely and accurate data source. A data warehouse is the source of choice due to its integrated, timely and structured nature.
- Easy accessibility to meta data. IT developers, database administrators, analysts and program managers will be interested in the technical meta data, such as an

impact analysis on a field change in the source data. Users' meta data needs can be distilled into two basic questions: "Where do I...?" and "How do I...?"

The systemic creation and maintenance of meta data is one of the greatest benefits of automated data warehouse creation and management tools. Manual creation and maintenance is very resource intensive.

- Desktop, GUI data access. The query and reporting tool will be the primary interface between the user and the data warehouse. To most users, in fact, the query and reporting tool becomes the identity of the entire program. Consequently, that tool needs to be robust, capable, flexible, and present an attractive face. In general, anything beyond the desktop will be invisible to users.

- Managed query environment (MQE). Successful implementation of end-user data access requires putting a structured layer of protection between users and the data that is created by people with an understanding of the data and its business rules. The environment that is supplied to users needs to provide all necessary joins, security and structure as an inherent part of its paradigm.

- Open data exchange. To transform raw data into meaningful information users must be able to easily share the data they extract from the data warehouse with other desktop tools. The query and reporting tool must easily support the clipboard, writing common file formats, flexible file delimitation, and automated data transport to other tools via DDE (Dynamic Data Exchange), Publish and Subscribe, OpenDoc or OLE.

- Data analysis. Users must be able to quickly and easily analyze the data they extract from the data warehouse. Users will require sorting, summarization, charting, a flexible cross tab engine and, to a lesser extent, statistical analysis.

- User-created data sets. To create, monitor, and measure programs and processes from the desktop, users must have the capability to create and integrate their own data sets on the server.

Having a set of users that can measure the ROI of their programs from the desktop with no outside support creates a significant asset when it comes time to calculate IT's ROI for implemented or proposed technologies. The ability to list users' ROIs that were possible as a result of IT's technology choices is a powerful and persuasive argument for current and future investment. ■

*Hackney is president of Enterprise Group, Ltd., a consulting firm specializing in data warehouse informative delivery systems. He can be contacted via E-mail at [hackney@Gix.netcom.com](mailto:hackney@Gix.netcom.com).*

## THE SYSTEMIC

CREATION AND  
MAINTENANCE OF META  
DATA IS ONE OF THE  
GREATEST BENEFITS OF  
AUTOMATED DATA  
WAREHOUSE CREATION  
AND MANAGEMENT  
TOOLS.

## GTE Empowers Decision Makers

**I** need a complete report on Hispanic households with a median income of less than \$40,000 that generated more than \$50 per month in telephone toll revenue during the third quarter of 1994."

That's exactly the kind of information a product manager needs to determine the viability of a new service or product offering. It's also the kind of query that might have taken GTE Corp.'s GTE Telephone Operations unit weeks to execute. Data from a variety of different sources would have to be accessed, integrated and reconciled. And, in the end, all that work would have been done to satisfy a single request.

But no more. GTE's business managers can now get information requests answered fast because their enterprise data warehouse allows them to draw from a variety of disparate data sources. That's not only convenient, it's essential in the intensely competitive world of telecommunications services.

"If we can get data delivered to decision makers more quickly, we can beat the competition," says Perry Kosieniak, a senior application consultant.

### OPERATIONS VS. DECISIONS

The distinction between operational and decision-making needs was a key factor in GTE's move to data warehousing. While existing applications and infrastructure may be adequate to support day-to-day functions such as order taking and billing, they are often insufficient for strategic decision making.

"Decision making usually requires

integration of data across multiple subject areas, such as customers, network usage and billing," says Kosieniak. "It may also require the use of sources outside the existing application environment, such as zip code tables or demographic data."

There are performance issues which also distinguish the two types of data management. Operations

environment to meet specific needs.

Down the road, however, GTE plans to use a data warehouse to supplement some of its operational applications, such as customer profiling.

Speedier decision making isn't the only benefit that GTE expects to realize from its data warehouse solution. They also expect to increase the efficiency of both IT and the business

units. On the IT side, the need for numerous staffers to service the constant stream of data requests is being significantly diminished. "With the data warehouse, you make available resources [that were] previously committed to extraction, replication and reporting," says Susan Guess, another GTE application consultant.

By improving these processes, GTE can reduce its costs and thereby lessen the need for outside contractors. The cost reductions enable the company to offer its own services at lower rates, which is essential to maintaining its competitive position.

On the business side, staff resources can be used more efficiently.

"People in the business functions outline querying pools as well," says Guess, "and they can spend a lot of time trying to obtain the data they need." Now they can focus on their real jobs, she says, to analyze and respond to, decision data, rather than struggle to access it.

The main benefits of data warehousing, though, continues to be GTE's ability to respond quickly to the need for accurate, comprehensive data. "The demand for information is continuous," says Guess. "Data warehousing will help IT satisfy that demand and be an enabling factor in the business equation." ■



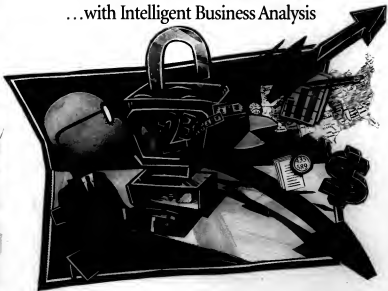
Speedier decision making and increased efficiency for both its IT and business units is what GTE Telephone Operations expects to gain from its data warehouse implementation.

systems such as online transaction processing tend to place a fairly consistent burden on computing resources. Online query processing, on the other hand, tends to be unpredictable, with periods of intense activity alternating with periods of minimal use.

"You don't want to suddenly submit a large query to an operational server," says Kosieniak. "Not only could you get a slow response, but you may also adversely affect the performance of your operational system." By providing two distinct infrastructures for legacy systems and decision making, GTE can tailor each

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## THE NEXT DIMENSION IN

## Data Warehousing

Decision makers need more than access to the data warehouse. Multidimensional analysis has emerged as a powerful and intuitive approach to select, analyze and present trended data from a business perspective. Applications include EIS, DSS, forecasting, and budgeting.

A recent survey by industry consultancy META Group showed that 65% of CIOs developing data warehouses are now considering multidimensional analysis a high priority.

MULTIDIMENSIONAL ANALYSIS  
WITH RELATIONAL DATABASES

The first multidimensional systems used built-in databases to store data. Most experts now agree that multidimensional tools can offer significant benefits. Key in evaluating these tools are:

- Direct access to relational databases
- Database scalability
- Wide support of popular front-end tools
- Relational database performance tuning and monitoring tools
- Ability to load data incrementally (not refreshing entire database)
- Unlimited number of dimensions
- Data warehouse development and maintenance tools to support relational databases.

The performance characteristics of proprietary multidimensional databases are matched or exceeded by implementing a relational multidimensional database.

CRITICAL MULTIDIMENSIONAL  
ANALYSIS FUNCTIONALITY

All multidimensional tools are not created equal. Look for tools that allow users to browse and drill down through the data warehouse from a dimensional business perspective, shielding them from data complexities. Users should have the flexibility to create custom calculations and item groupings, like trending product shares, in test markets.

Multidimensional tools should support the sharing of the decision-making process across workgroups and the enterprise. The tools should be open so that applications can be enhanced and expanded to meet changing corporate goals. Meta data should be used and is key as the link that describes the data warehouse to applications, and transparently holds business analysis rules.

## THE BOTTOM LINE

Relational databases offer benefits for multidimensional analysis. Look for solutions that provide power, performance, flexibility, openness and scalability, and minimize IT support — as well as connect directly to standard relational databases. ▀

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products and services  
offer enterprises complete  
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solutions.*

*Our joint  
relationships offer  
your company the  
knowledge and  
experience needed to  
successfully manage  
business information in  
an open systems  
environment.*

# Unisys to support Microsoft products in Europe

By Torsten Buse  
WINNIE

Under an agreement with Microsoft Corp., Unisys Corp. now offers support for Microsoft products throughout Europe.

As a certified Microsoft Solution Provider Authorized Support Center, Unisys will support users of Microsoft's desktop operating systems and other selected software, including the upcoming Windows 95, MS-DOS, Windows, Windows for Workgroups, Mail, Windows NT, Windows NT Server, LAN Manager, SQL Server and others.

The agreement initially covers 15 European countries, including France, Germany, the UK, Italy, Spain, the Scandinavian countries and others, a company spokesman said.

Unisys will support remote, electronic or on-site services and quick-response telephone support. The Blue Bell, Pa.,

company became a Microsoft support center and Microsoft Authorized Technical Education Center in the U.S. last year. It also became a member of the Microsoft Windows 95 Launch Support Team program. As a team member, Unisys will provide warranty and post-warranty support to Windows 95 users.

Users of Microsoft products in Europe

and North America can rely on Unisys as a single point of contact for support regardless of the manufacturer or supplier of their hardware systems, Unisys said. In turn, Microsoft will provide Unisys with support specialist training, beta products, product updates, technical information and technical support tools, Unisys said.

Unisys is also a certified Novell Authorized Support Center, and the company maintains reseller and authorized warranty agreements with AT&T Corp., Bay Networks, Inc., Cisco Systems Inc., Compaq Computer Corp., IBM and Lotus Development Corp.

Buse writes for the EDG News Service.

## Briefs

### FoxPro prices unveiled

Microsoft Corp. has disclosed the pricing for Visual FoxPro for Windows. The standard edition will cost \$199, and upgrades will cost \$99. The professional version will cost \$499 with upgrades from the standard edition and upgrades from competing products costing \$299. Upgrades from FoxPro 2.6 will cost \$249. Visual FoxPro will ship by the end of June.

### Compaq bundles link

Compaq Computer Corp. said it would bundle LapLink for Windows from Transwarp Software, Inc. in Bethel, Wash., on all of its Presario PCs. Compaq said the product saved its help desk employees as much as 50% of the time they spent on support calls.

### Flash memory deal

LG Semicon Co. took a minority stake in SunDisk Corp., the leading manufacturer of flash memory cards. LG Semicon, a division of Korea's Lucky Goldstar Group, will also manufacture flash memory for SunDisk in Santa Clara, Calif.

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also helps Tom Welch confirm that  
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sure Carol Boyd's daughter gets the  
medical treatment she needs.



*Information management*  
isn't just processing 10 billion checks a year.

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check cleared today.



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processing millions of reservations for  
140 of the world's airlines.

*Information management* also tracks every leg of  
Richard Wong's trip—even across several airlines.



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data processing

vs.

Unisys  
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Sure, we sell information technology and services. But our real business is turning information into management insights that will help you attract and retain customers. And the value of that should be easy for anyone to see.

For more information, or to receive your own "Guide To Information Management" facts kit, reach us on the Internet at <http://www.unisys.com/adv> or call 1-800-874-8647, ext. 221.

**UNISYS**

## Desktop Computing

Sigma Designs Imaging Systems, Inc. announced ActionFX, a PC graphics controller for document imaging.

According to the Fremont, Calif., company, ActionFX is one of the industry's fastest Peripheral Component Interconnect-based graphics cards. It is also a color video display controller for docu-

ment imaging systems, and it has full-screen, full-motion, 30 frames/sec. video playback capability.

The ActionFX controller is based on open industry standards and is compatible with all document imaging software applications. It provides integrated video graphics array support and graphics user interface acceleration for operating environments including Microsoft Corp.'s Windows, Windows NT, Windows 95 and IBM's OS/2 and OS/2 Warp.

Pricing for ActionFX starts at \$729.

► *Sigma Designs Imaging Systems*  
(510) 770-1180

Zyxel has announced the Zyxel Elite series of Integrated Services Digital Network (ISDN) modems.

According to the Anaheim, Calif., company, the Elite is the first series of modems to provide ISDN and V.34 transmission capabilities in a single device. It lets ISDN's two 64K bit/sec. B channels com-

bine for 128K bit/sec. transmission.

The series was designed to automatically switch between an ISDN data call and a modem data call for an incoming transmission via fax machine/voice without intervention.

Each of the modems in the Elite series operates on DOS, Windows, Macintosh and Unix systems, as well as in IBM's OS/2, AS/400 and RS/6000 and Novell, Inc. environments.

Pricing for the Elite Series modems starts at \$549.

► *Zyxel*  
(714) 683-0800

CDS, Inc. recently introduced Passage 1.0, a networkable document conversion application product.

According to the Raleigh, N.C., company, Passage 1.0 combines scanning, image processing, optical character recognition (OCR) and word processing technologies to convert hard-copy tables into on-line tables instead of ASCII text. Passage 1.0 uses Microsoft Corp.'s Word for Windows for verification and formatting of the OCR output. It works with an optical scanner attached to a PC running Windows 3.1 or later.

Passage 1.0 costs \$495. Concurrent licenses are available.

► *CDS*  
(919) 858-6600

Epson America, Inc. recently announced Action Tower 8200, a high-performance multimedia PC.

According to the Torrance, Calif., company, Action Tower 8200 includes Peripheral Component Interconnect local bus architecture, advanced telephony, quad-speed CD-ROMs, sound cards and amplified stereo speakers. It also features Internet connectivity and comes preloaded with more than 20 software titles. Action Tower 8200 has 3M bytes of RAM, 256K bytes of cache, 1M byte of video RAM and a 540M-byte hard drive. It runs on an Intel Corp. Pentium chip.

Pricing for Action Tower 8200 starts at \$1,599.

► *Epson America*  
(310) 733-0700

Avista Software, Inc. has released Avista Financials, Windows-based accounting and business management software. According to the Norwood, Ga., company, Avista Financials is a client/server, 32-bit application that uses a high-performance database to summarize transaction data and ensure data integrity. It includes navigational and filtering features.

Avista Financials is available in customized modules including General Ledger, Accounts Receivable, Accounts Payable, Purchase Order, Job Cost and Order Entry.

Avista Financials supports Windows 3.1, Windows NT, Windows 95 and IBM's Win-OS/2.

Pricing is based on a scalable, usage-based model and starts at \$700.

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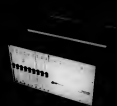
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# Workgroup Computing



WIRELESS GETS  
UNPLUGGED, \$7  
NEW PRODUCTS,  
68

By Tim Ouellette

Someday soon, employees who perform high-volume processing in the office will be able to work from home—that is, if companies can deal with the management issues involved.

Thanks to the availability of low-cost Integrated Services Digital Network (ISDN) lines, high-capacity client/server networks and the development of Sigma Imaging Systems, Inc.'s OmniDesk Remote Workstation software, telecommuting for these workers now is technically possible.

While most telecommuters to date have been knowledge workers such as salespeople, consultants or architects, employees normally stuck in the office processing image documents like auto loans can now perform these duties at home, given management acceptance.

"Most of the challenges are organizational and cultural" rather than technical for this type of telecommuting, said Connie Moore, director of workflow, document and imaging strategies at BHS Strategic Decisions in Norwell, Mass.

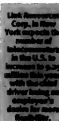
## A question of balance

Organizational issues include managing by goal objectives instead of direct observation, maintaining good communications between management and employees and clearly defining roles and expectations. For the telecommuter, they also include balancing family and work life.

"These questions are harder than asking if you can get an ISDN line into the house," said Eugene Friedman, a former vice president at Chase Manhattan Bank NA in New York who helped organize Chase's pilot telecommuting program.

# Home alone

For claims workers or loan processors, image-enabled systems and faster data access mean new options in telecommuting



New York-based Sigma Imaging Systems is breaking new ground, according to Bruce Silver, an industry analyst and president of Bruce Silver Associates in Weston, Mass.

Moore, a telecommuter herself, added, "There is nobody else out there doing this. This is unique because Sigma has a vision of the future for the enterprise, which is home workers. They are looking at production, mission-critical applications that are done in the home."

Empire Blue Cross/Blue Shield of New York plans to switch up to 10 claims processors to a telecommuting program. At the Association for Information and Image Management '96 show in San Francisco recently, Empire employee Ray Fulton demonstrated the system by processing claims off a server located in New York.

"Telecommuting was inevitable for us," he said, citing the long commutes for many of his co-workers.

Other companies experimenting with Sigma's technology include Chase Manhattan, Consolidated Edison Co. of New York, Inc. and the Danish Board of Industrial Injuries in Denmark, which handles workers' compensation.

According to Gillian Williams, director of Empire's Indemnity Systems Development Group,

the company is making sure productivity levels can be maintained before it begins the program. Empire is now testing the remote workstations on site and monitoring how well employees on the machines meet their workload requirements.

## Marking it work

Early adopters were positive about the prospects for success. "It works. It works today, and it's available today," Friedman said.

For a telecommuting system to work best, Friedman said, the work process should involve a simple, predictable workflow to move images along; reasonable document file sizes;

and self-contained work items to measure productivity. He cited customer service and claims as good starting points for a telecommuting program.

At Empire, the final stage in the program, which can be the most crucial, will be to choose the participants. Williams said employees chosen to work at home must be able to work independently, manage their time well and balance work and home life.

Now that there is more information to work with on the screen, compared with using dumb terminals to process the claims, employees should be trained in the technical details of the system, she added.

"Since you will probably be using your best people, don't underestimate their intelligence to understand this technology," Williams said.



## Setting up shop

If your business involves insurance claims processing, transaction processing, accounts payable, customer service or mortgage processing, the Sigma Imaging Systems' system may have something to offer you.

Those are the sample applications that can be used on the image-enabled

system because they can use images of documents. A typical system configuration might include Sigma Imaging Systems' OmniDesk Remote Workstation and OmniDesk Windows NT or OS/2 server software, coupled with an image-enabled Remote Workstation running IBM's OS/2 or Microsoft Corp.'s Windows or Windows NT.

The cost for an average system with 16 Remote Workstations ranges from \$35,000 to \$50,000. The average monthly

cost for eight hours of ISDN connectivity a day from a distance of 20 miles is \$246, according to Ameritech Corp., a regional ISDN provider.

Supporting a telecommuter can be cheaper than supporting a fully loaded office each month, according to telecommuting proponents. One estimate of office costs, based on New York-area market values, totaled \$792 per employee for utilities, maintenance, rent and security.

Sigma claims to have overcome one problem with ISDN lines, which can take more than six seconds to transmit a 50K-byte image, such as a medical claim form. Because production workers usually require fast response times, Sigma uses a fetch-ahead workflow feature to move the next scheduled item across the lines to a work queue where it waits for the user to complete work on his current document.

—Tim Ouellette

Michael Tilson and Richard Jaross

## Keeping Unix in UniForum

Joan Bozeman's column "Is Unix going soft?" [CW, April 3] refers to discussions among vendors at UniForum '95—and considerations by UniForum itself—that the association change its name and the name of the show.



Tilson



Jaross

Let us set the record straight. As the country's leading organization for users of Unix and open systems and the sponsor of the largest open systems conference and trade show, the UniForum Association has tremendous brand equity in its name. Consensus indicates that we would never lightly change the name of our trade show, and any future name change of the show or the association would only come after much consideration and research. The only reason for the change might come from the confusion between the role of the association and the role of the trade show. We do

not intend to abandon our core values.

While UniForum is not changing its trade show name or its legal name, the issue raised by Joan Bozeman is a bigger one and more profound. We believe, and we have the sales figures to back it up, that Unix has never been stronger. It would be foolish for UniForum to move away from its core constituency—and we won't. We remain committed to the advancement of information technology based on shared development, and we share as strong a bias as ever against monopolistic practices. We do not believe that Microsoft's Windows NT is an open system, and if the idea of a name change ever gave anyone that notion, the matter should now be laid to rest.

UniForum, page 60

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# Wireless makes small gains at show

By Michael Fitzgerald

NEW YORK

While working without wires in the computing world is possible, the Network World Unplugged show held here recently illustrated that possible is not the same as plausible for many corporate users.

The show drew most of the wireless enthusiasts, and most companies showed their current wares.

"It's not a shrink-wrapped market yet, and it's still a vertical market play" for many vendors, said Alan Reiter, editor of "Mobile Data Report," a newsletter in Alexandria, Va.

## On display

The few new products announced included the following:

- **MCI Communications Corp.** showed Xstream Air, which uses standard analog cellular communication to connect mobile users to the Internet. Xstream Air connects over frame relay and sends data at up to 14.4K bit/sec.

MCI said it will make this local Internet access available in 200 cities this year. The average usage price will be 6 cents/min.

- **Digital Equipment Corp.** and Proxim, Inc. said they would team up to make wireless LANs easier to use. Maynard, Mass.-based Digital licensed Mountain View, Calif.-based Proxim's RangeLAN2 technology and said it will use this to integrate frequency hopping into its RoomAbout wireless LAN technology.

• **RDC Communications, Ltd.**, an Israeli firm with U.S. headquarters in Foster City, Calif., began shipping FortiLAN, a wireless LAN that gives users mobility in an office setting. RDC claims its FortiLAN product has a range of up to 2,300 feet. In an office, the range is from 300 to 500 feet. RDC's User Unit, an AT bus or PCMCIA adapter card plus a radio cost \$895. An Access Point wireless bridge, an AT bus board and radio cost \$1,195.

Meanwhile, McCaw Cellular Communications, Inc. officials said in interviews they planned to aggressively roll out their Cellular Digital Puck Data (CDPD) network.

"We're deploying pipe way ahead of demand," said Kerndt VanderMeulen, vice president and general manager of McCaw's Wireless Data Division in Kirk-

land, Wash. VanderMeulen said that McCaw believes CDPD will gain rapid customer acceptance as it is rolled out.

McCaw at one point had promised nationwide CDPD service by the end of last year, but it is coming to market with CDPD service later than some of its rivals. VanderMeulen said that McCaw has

delayed coming to market in part to make sure it works all the bugs out.

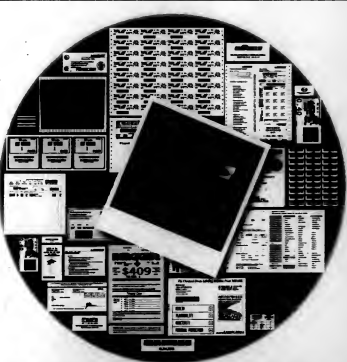
"Given that we were already late, why should we release a sloppy service?" she asked.

McCaw did its own network integration, which some critics say caused its deployment delays. VanderMeulen sug-

gested if McCaw had not done its own network integration and equipment testing, the market would be further behind.

VanderMeulen also said McCaw was interested in a hybrid CDPD/Circuit-Switched Cellular connectivity specification that has been proposed to the CDPD Forum, Inc. But she said McCaw will not support the proposal yet.

"We like the concept, and we're in the process of ironing out the implementation" with other carriers, she said.



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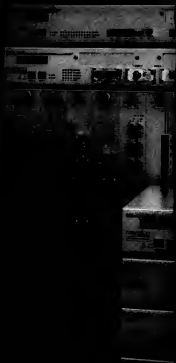
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# Toshiba speeds PowerPC server release

By Rob Guth  
TOKYO

Not wanting to be left behind in the race to win users moving to distributed systems, Toshiba Corp. will release a PowerPC-based midrange computer in September a year earlier than originally planned, company officials said recently.

The server, the result of a PowerPC licensing deal signed with IBM last September, will use IBM's AIX and will likely run on the PowerPC 604, the officials said. The next-generation 80486, originally slated for shipment this quarter, are now due in quantity sometime in the second quarter, according to press reports. Toshiba pushed up the server release

to catch a pending massive shift toward client-server-based systems in Japan, said spokeswoman Kazuo Matsumoto. The demand for servers is expanding very rapidly so we decided to accelerate development [of the server]," she said.

Guth writes for the IDG News Service's Tokyo bureau.

## UniForum

CONTINUED FROM PAGE 55

The fact remains, however, that there are millions of PCs on desktops out there. These machines present information technology management with unresolved issues of connectivity, while the question of true portable computing in heterogeneous multivendor environments remains to be addressed.

There is a crying need for UniForum—all that it does—to be active in helping

as broad an audience as possible solve such problems. That is why UniForum has embraced change in its conference program's content, its publications' content and the composition of its membership. We are not the same organization as the old

/usr/grp founded almost 15 years ago. UniForum has never wanted to stand still and watch the industry evolve without being part of the change. We helped Unix win, but there's more to do.

This new and broader mission for UniForum has the support of our board of directors and has spurred vigorous debate at our meetings and among our staff and membership. It is not a debate about whether to change our association's name, but rather a debate about how to change. What new directions should we embrace, where should our resources go, what new dragons should we slay?

### Dealing with reality


As for the trade show, attendees at UniForum '86 should not be surprised to see a Microsoft booth. We invite them to exhibit every year, and they are most welcome. And many UniForum exhibitors tout new links to Microsoft products.

The market is a big one, users are more sophisticated, and vendors are smart enough to know they must deal with the reality of what is installed in business. That doesn't mean the open systems community has rolled over and let itself be co-opted by Microsoft. We think monopoly domination of the industry by one player is not in the best interests of users. But that doesn't mean we can't do business with the monopoly if it's important to our community.

Timon is president of the UniForum Association in Santa Clara, Calif., and senior vice president of services. The Santa Cruz Operation, Japan is executive director of the UniForum Association, and he can be reached via the Internet at rich@uniforum.org.

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## Client/server storage

## Software puts mainframe data on disc

By Tim Ouellette

As summer approaches, more than a few information systems shops will be thinking COLD, as in Computer Output to Laser Disc software, as part of their client/server strategy.

COLD server software writes and indexes mainframe reports on laser disc, replacing the traditional green bar report or microfiche. COLD client software lets users search, select and output the data stored on disc much faster than they could with microfiche or by sifting through paper printouts.

## Clear benefits

With a recent push from large vendors including Wang Laboratories, Inc. in Lowell, Mass., and IBM in Armonk, N.Y., into the COLD market, analysts said they see significant growth potential there for 1986.

"The big vendors have determined that this is a market to go after" because it piqued user interest and the desire for an established vendor in an area where most COLD firms have been smaller, said Mason Grigsby, a principal at Output Strategies in San Francisco. With the number of systems said expected to skyrocket (see chart), "it will be an installation problem more than a selling problem," he said.

A COLD system is easy for IS to sell to management because of its clear cost benefits. "You can get return on investment in one year in hard dollars," Grigsby

said. "You can prove there is a hard dollar payoff in microfiche replacement, paper replacement and labor."

At PriceCostco in San Diego, a COLD system coupled with imaging is expected to pay big dividends. The company, a merger of membership warehouse chains Price Club and Costco, expects to see savings in labor and early payment discounts of up to \$7 million during the next five years, according to Vince Carney, vice president of merchandise accounting.

## Customer service bent

But there is another important factor for users. At AGF Management Ltd., a mutual fund management firm in Toronto, customer service was the primary reason to install COLD software.

"The whole application was justified on customer service and customer service alone," said Henry Koo, vice president of information technology. Employees can now quickly access client information and provide clients with reprints of statements.

"The whole application was justified on customer service and customer service alone," said Henry Koo, vice president of information technology. Employees can now quickly access client information and provide clients with reprints of statements.

## According to Output Strategies in San Francisco, there are about 100 client/server COLD systems currently installed.

Wang's Open/cold plus software in concert with Open/image. The Wang product, based on Computer Output On-

Line/AllPoints Addressable (COOL/APA) from Computron Technologies Corp. in Rutherford, N.J., runs on Unix at the server level and Windows at the client level.

Open/cold plus, geared to handle high volume and enterprise-wide user access, stores data and images. Users said the client software was easy to use and gave it high marks for integration.

For example, Koo said the software provides a light fit with Sybase, Inc.'s Powerbuilder for development needs.

## New releases

Client/server COLD software releases at the recent Association for Information and Image Management '85 show in San Francisco came from Computron, Optika Imaging Systems, Inc. in Colorado Springs and INCHI Corp. in Westboro, Mass. IBM is expected to release a COLD system based on its RS/6000 platform this year.

PriceCostco, which uses Optika's F/Report COLD software integrated with its imaging product, is looking to spread

COLD around the company. "We expect more COLD applications because there are so many more opportunities out there," Carney said.

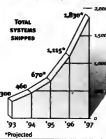
While many companies have separated the imaging and workflow functions in their products, analysts said they see more integration of imaging and COLD software, such as that of the products from Wang, Computron and Optika. This trend to integrate imaging may make COLD a name that doesn't fly.

"COLD is kind of no longer an appropriate acronym because most of the big systems have temporary magnetic storage besides the optical storage, like a two-level hierarchical storage management system," Grigsby explained.

But at the same time, it gives users more options. "COLD has moved from an alternative to microfiche to handling every kind of document you have in the company," said John Freeman, president of Strategic Marketing Decisions in Los Gatos, Calif.

## COLD is hot

Entries by major players such as Wang and IBM are driving the client/server Computer Output to Laser Disc (COLD) systems market.



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## Workgroup Computing

Connectix Corp. recently announced Quickcam for Windows, a video input camera for Windows users.

According to the San Mateo, Calif., company, Quickcam for Windows plugs into the standard parallel port of most PCs and can be used for videoconferencing, video-mail composition and live

World-Wide Web pages. It also works as a still camera, and those pictures can be used in database records and PC-generated documents. It provides both still and video images of up to 320 by 240 pixels in 6-bit grayscale.

Quickcam for Windows costs \$149.

► **Connectix**  
(415) 571-5100

Turner Concepts, Inc. has announced Razor 3.5, a suite of Unix-based image-

tracking and configuration management tools.

According to the New Hartford, N.Y., company, Razor 3.5 tracks issues or problems with detailed date and time information. It also has a release management mechanism that projects definition control.

It supports IBM and Sun Microsystems, Inc. platforms and runs on IBM's AIX 3.2, Sun's Solaris and SunOS, Hewlett-Packard Co.'s HP-UX and Silicon

Graphics, Inc.'s Irix operating systems.

Razor 3.5 costs \$495 for a single-hosting license.

► **Turner Concepts**  
(315) 724-3540

Intrafile, Inc. has announced Intrafile CFI, a document indexing software suite.

According to the Bethesda, Md., company, Intrafile CFI lets users perform document ending, data validation and data entry masking. It also defines index fields and determination and editing of document boundaries.

The client/server application runs on Windows with a Microsoft Corp. Windows NT server. Index data is stored in Microsoft's SQL Server.

Intrafile CFI costs \$2,000 per seat in quantity.

► **Intrafile**  
(301) 564-5600

Maximum Strategy, Inc. has announced the Generation 5 storage server.

According to the Milpitas, Calif., company, the Generation 5 off-loads a large portion of the data transfer management overhead from the host. It also delivers high-bandwidth data transfer for high-performance parallel interfaces (HPTI) and fiber channel standard (FCIS) channels and provides a high sustained data rate.

The Generation 5 storage server is designed for use in data-intensive applications such as large database searches, computational fluid dynamics, real-time telemetry and full-motion visualization.

Pricing for the Generation 5 storage server starts at \$105,000.

► **Maximum Strategy**  
(408) 383-1600

Quadbase Systems, Inc. has released Quadbase-SQL for Windows, a scalable, SQL database management system.

According to the Santa Clara, Calif., company, Quadbase-SQL for Windows is a local engine that can support stand-alone applications as well as multitier workgroup applications on a network without a dedicated server.

The client library supports Microsoft Corp. Windows and Windows NT applications. Other tools include a Windows-based utility for ad hoc query report writing and database maintenance, an Open Database Connectivity driver and a client monitor/debugging facility.

Quadbase-SQL for Windows is priced at \$365.

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## Florida info highways don't intersect

Officials face challenge in coordinating individual state networks

By Mitch Bette  
TALLAHASSEE, FLA.

Information systems managers in Florida state agencies have an enviable position. Besides the state capital's balmy weather, they enjoy direct, highway access to a governor and cabinet members who take an active interest in exploiting information technology.

One result of that intense political interest, however, is that Florida has three statewide information highways, each one built by a different agency for its own mission. Instead of building an information superhighway, a critical report said, Florida is "still building disconnected backroads."

"With three different networks, we run the risk of going in divergent directions," said Mike Hale, executive director of the Florida Information Resource Management Commission.

The state now faces the issue of how to coordinate the networks so that there is a single access point for the public. The overlapping networks are the following:

- The Florida Information Resource Network (FIRN), run by the state Department of Education, for classrooms, school districts and administrators. FIRN has gateways to the Internet and more than 17,000 electronic-mail users.

- The Florida Library Network, run by the Department of State, is an effort to provide the public with electronic state government information and Internet access.

- The Florida Communities Network, an initiative launched by Gov. Lawton Chiles to link state and local agencies with business groups for economic development and public access to government information.

### Can't get there from here

Actually, the three logical networks are overlaid on the same infrastructure — a T3 statewide voice, data and video network called Suncom — but the three networks are incompatible with one another. They are interconnected and have different data formats, officials said.

"Each one has grown up to serve its own constituency," said Glenn Mayne, telecommunications director at Florida's Department of Management Services.

A problem is that none of the three agencies wants to take a back seat to the others in terms of public visibility.

"We're just trying to avoid anything that looks like one agency is the gatekeeper for all state data because that's not the case," Hale said. "We don't want to stop what anybody's doing. We're just worried about redundancies, overlap and coordination. The public shouldn't be confronted with 25 methods of access," he said.

### FLORIDA'S THREE INFOHWAYS:

Florida Information Resource Network  
(for education)

Florida Library Network  
(for education)

Florida Communities Network

## Vendor finds benefits in switching markets

By Laura Dille

After several years of languishing without a specific technology direction, Ascom-Timesplex, Inc. — best known for its multiplexers — is making a big push to establish itself as a leader in the high end of the switching market.

And it seems that users are listening. In the past two months, Ascom-Timesplex has closed deals with a slew of new customers for its Synchrony devices in the U.S. and internationally. The company's new units, ST-50 and ST-1000, make up a family of hybrid frame-relay switch/routers that can transmit combined voice, video and data traffic simultaneously.

New customers for Woodcliff Lake, N.J.-based Ascom-Timesplex include German Bundespost, British Telecom, Hibernia National Bank in New Orleans and Unisource, a consortium of the

French and Dutch postal, telephone and telegraph authorities and AT&T Corp. in Amsterdam.

### Glad to know you

Thad Hymel, manager of the distributed systems department at Hibernia, oversees connectivity among the bank's headquarters and approximately 140 branch offices. Hymel said Hibernia had never heard of Ascom-Timesplex before the Synchrony frame controllers were recommended by Systematics, Inc., a systems integrator in Little Rock, Ark.

But he said he is glad Systematics made the suggestion.

"Ascom's ST-50 and ST-1000 represent an innovative approach for integrating LAN and legacy" traffic generated from IBM 3090s, he said. Hibernia has been using Ascom-Timesplex routers and hubs for the past five months and is set to install the ST-50 and ST-1000.

"The equipment is pretty reliable and works well overall. We like the fact that the routers carry WAN and Synchrony Data Link Control traffic and let us hook up to the ATM backbone. Ascom is one of the first companies to provide that range of functionality in a single box," Hymel said.

The newest member of the Synchrony family, ST-1000, began shipping in April. Like ST-50, it carries a list price of \$20,500 for the basic unit. It is a high-speed backbone device aimed at large corporate or-

hemorrhaging good people, unable to deliver key products and heading toward a serious revenue ditch," said Tom Nolle, president of CDM Corp., a consultancy in Voorhees, N.J. "They've now done an about-face on the strength of the Synchrony line, which is a very interesting concept."

### Filling the need

Nolle likened the Synchrony line to Netrix, Inc.'s original synchronous frame architecture and AT&T's Integrated Access Control System. He said the intent of all these devices is to transport a mixture of frame-relay and data packets "on a common trunk."

"There's no question that users have a requirement to do this today and [that] the need is growing by leaps and bounds," Nolle said.

Additionally, Ascom-Timesplex will fill one of the most glaring gaps in its product portfolio when it introduces its first Asynchronous Transfer Mode (ATM) switch this summer, Phillips said.

The so-called ATM AXS+ ATM switch goes into beta testing this month at a number of sites, including Cambridge University in Cambridge, England, Phillips said. The forthcoming AXS+ will support up to 64 ports. Pricing has not yet been set on the AXS+ ATM switch.

The Synchrony ST-50 and ST-1000 are stand-alone multiplexers that use Ascom-Timesplex's Express Routing to transmit voice, video and data over a WAN.

**Express Routing:**

- Reduces bandwidth requirements
- Minimizes network broadcasts
- Provides encrypted and header compression
- Lets users design lower-cost, high-capacity networks
- Supports a multiprotocol switching platform
- Supports future multimedia and demand-intensive applications

ers that incorporates both frame-relay switching and time-division multiplexing in a single chassis, said Ascom-Timesplex President Randy Phillips.

"What a difference a year makes."

"A year ago, Ascom-Timesplex was

# Firewalls come under fire

By Gary H. Anthes

A network firewall is all the rage these days as users move to protect themselves against computer intrusions from the Internet. However, security experts warn that firewalls are often set up incorrectly and may actually increase the risks a company faces by fostering a false sense of security.

A firewall is a computer placed between the Internet and internal systems and programmed to block certain kinds of traffic flowing into or out of the company. Routers with IP packet filters sometimes act as firewalls.

"Everyone says 'firewalls,' but I don't like them," said Jeffrey Schiller, area director for security on the Internet Engineering Steering Group and a network manager at MIT. "They don't always work."

Schiller says firewalls are worth having, but he predicted that the most sophisticated computer criminals will learn how to penetrate the standard firewall products and that users will be left unknowingly exposed.

## On the side of caution

William H. Murray, an information security consultant to Deloitte & Touche, warned against relying on the vendor's decision to configure the firewall. "Most vendors build their firewalls to resist known attacks," he said. "But the problem is that things that were perfectly safe a year ago are no longer safe now."

Murray recommends that users adopt "very conservative" policies, such as an absolute prohibition against IP addresses passing through the firewall so that no outside hacker can learn the addresses of machines he may wish to attack.

A nice by-product of such strict rules is that "the more conservative the policy, the easier to set up the firewall"

re-free," Murray said.

Indeed, setting up and maintaining a firewall can be tricky and error-prone, sometimes leaving hidden doors in corporate networks. For example, some of the security holes in Unix, which most firewalls run, can leave the firewall vulnerable, said Robert A. Clyde, vice president of security technology at Axent Technologies in Rockville, Md. "Even more common, holes are inadvertently created by incorrect administration of the firewall," he said.

Despite its use of firewalls, General Electric Co.'s systems were penetrated last year, a situation that led the giant company to sever all its links to the Internet for 72 hours (CW, Dec 5, 1994).



The Computer Emergency Response Team at Carnegie Mellon University in Pittsburgh dealt with Internet-related computer security incidents. It handled 2,241 incidents that affected 40,145 sites last year. In 1993, 1,334 incidents were reported.

## Defensive balance

Clyde pointed out that a firewall is a "perimeter defense" offering no protection against nefarious insiders or the well-meaning employee who bypasses the firewall by establishing his own ad hoc Internet connection. He advised users to view firewalls as just one component of a comprehensive security program that includes other elements such as cryptography, intrusion detection and physical security.

Robert P. Campbell, president of Advanced Information Management, Inc. in Woodbridge, Va., said there were about 15 firewall vendors just nine months ago, but now more than 30 exist.

"Some are just taking shareware, modifying it and putting on their own labels," he said.

"Products are rolling out so fast, the integrity is not what it ought to be in some cases."

Campbell said users cannot avoid hard work if they wish to be adequately protected by a firewall.

"You have to come up with a set of [filtering] rules. You have to do analysis and get consensus. Then you have to monitor it," he said.

## The hot zone

**T**here are several ways to build firewalls, each with pros and cons, said Steven M. Belovise, a network security researcher at AT&T Bell Laboratories and co-author of *Firewalls and Internet Security—Reporting the Why How*.










Packet-filtering gateways, included as software in routers, block the passage of IP packets based on their source or destination addresses or services. The network administrator maintains a table of what is allowed.

Packet filters are efficient and inexpensive because the user is most concerned already with a router. However, setting up and maintaining the rules is "dangerous and error-prone," Belovise said. Also, they do not handle some services such as File Transfer Protocol well, and their integrity can be compromised by bugs in the router vendor's software.

Another approach is using in-application-level gateways, which employ specialized code for each application instead of general-purpose code for all traffic. These gateways tend to be more secure and simpler because the actions of only a few programs need to be analyzed. However, because filters must be written for each application, it is harder to add new services, Belovise said.

"Certain kinds of attacks can get through almost any conceivable firewall," Belovise said. "For example, if someone imports a virus from the Internet, the firewall won't stop that."

## ORGANIZATIONS

-  Association for Computing Machinery (<http://info.acm.org>)
-  Computer Professionals for Social Responsibility (<http://www.cpsr.org>)
-  Data Processing Management Association (<http://magazine.dpmi.com/dpmi>)
-  Society for Industrial and Applied Mathematics (<http://www.siam.org>)
-  IEEE Computer Society (<http://info.computer.org>)
-  Internet Engineering Task Force (<http://www.ietf.org/ietf/na.html>)
-  International Communications Association (<http://www.icamp.org/ica>)
-  International Interactive Communications Society (<http://www.iiic.com/iiic.html>)
-  Windows User Group Network (<http://www.bell.com/windows/engnet.html>)

# Interactivity discovers new dimension

By Ellis Bookser

Welcome to the space station. Gliding through a corridor, which is fully rendered

in 3-D, you eagerly await another person.

This is Worlds Chat, a three-dimensional interactive environment for the Internet from Worlds, Inc.

"We think our interface is revolutionary when compared [with two-dimensional] graphical interfaces," said Gregory Skayne, chief financial officer and senior vice president of business development at the San Francisco-based company.

Two other companies have 3-D interactivity products—Ubique Ltd. in San Francisco, which last month unveiled a system

for adding interactivity atop WorldWide Web pages, and Fujitsu Ltd., which last month demonstrated WorldsAway, a 3-D interactive service that will first be available

in CompuServe subscribers in July.

## So what?

Nevertheless, analysts said business application of 2-D and 3-D environments—for virtual electronic shopping, for example—will take time.

"The point is, how does this enhance productivity?" said Daniel

Duncan, a principal consultant specializing in virtual reality at the New Research Group in San Francisco.

A number of analysts said the first non-game use of this technology will be for customer help desks.



Worlds' Knowledge Adventure World is a free proprietary browser on the 'net

Users on the Worlds Chat server appear to use another by selecting a 3-D "avatar"—a 3D model for "incarnation" adopted by the virtual reality user to express how one appears to others in a virtual world.

Users in 3-D spaces, represented as icons or movable cartoons, are limited to motion in the 2-D plane. Worlds' product increases verisimilitude by putting a 3-D virtual self inside a 3-D space. This allows users to travel down hallways, explore rooms and circle 3-D objects.

Two weeks ago, Worlds—formerly Knowledge Adventure, Inc.—offered its proprietary browser free on the Internet (<http://www.worlds.com>).

Another avenue for 3-D in cyberspace is the Virtual Reality Modeling Language (VRML), a 3-D viewer that runs atop the National Center for Supercomputing Association's Mosaic and Netscape Communications Corp.'s Navigator.

In April, Silicon Graphics, Inc. in Mountain View, Calif., and Template Graphics Software in San Diego introduced WebSpace, an add-on module for Web browsers and the first VRML-compliant tool.



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**IBM**

# Commission sets European telecom rights

By Elizabeth de Bony  
BONNEL

The European Commission is putting the finishing touches on its proposal to harmonize telecommunications interconnection rights across the 15 member states of the European Union. According

to commission officials, the plan will be finished in the next few months.

The directive will play a key role in Europe's liberalized telecommunications market after 1996, industry insiders said.

Without clear rules on the pricing of interconnection rights, there are no guar-

antees that alternative suppliers of services and infrastructures will be able to link with national systems at competitive prices.

"For a new entrant on the market, the highest cost involves linking up to the existing network," said Robin Seaman, manager of European Union affairs and

European regulation at British Telecom. Analysts agreed that the establishment of interconnection rights is crucial to market liberalization.

"The directive must be in place before the 1996 deadline for full liberalization of the entire telecom market," said Ali Kevli, an independent telecommunications analyst.

## The main thing

In its "Green Paper on Infrastructure," the commission acknowledged that "interconnection of competing telecommunications infrastructures and services will be the central commercial issue in a competitive environment," according to a commission summary of the document published in January.

The draft directive will provide a framework for negotiating interconnection terms, including charges. It will set dispute settlement procedures at national and European levels.

It will also include legal provisions establishing schemes designed to ensure that all telecommunications operators — both newcomers and former monopolies — share the cost of providing universal service.

The directive "will lead to changes in the regulatory environment of all member states," said Larry Stone, head of European Union affairs and European regulation at British Telecom.

De Bony is a correspondent at the DGB News Service's Brussels bureau.

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## Brief

### Buy stocks on the 'net.

Two Chicago firms, **Bessemer Investments** and **Shorecap APF, Inc.**, have introduced **Net Investor**, an on-line stock trading system available over the **World-Wide Web**. **Net Investor's** Internet location is <http://www.shorecap.com>.

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# RISC router links remote sites

By Laura DiDio

Compatible Systems, Inc. in Boulder, Colo., has introduced a wide-area, RISC-based router designed to link remote offices to networks at headquarters or to the Internet.

Dubbed the RISC Router 3400R, the five-port device has one Ethernet port for thick, thin or 10BaseT networks and four wide-area network ports, according to Matt McConnell, company president.

Shipping now, the router has a list price of \$2,195.

With this router, Compatible Systems is targeting the small, home and remote office market, according to Eric Hindin, senior network consultant at Strategic Networks Consulting, Inc. in Rockland, Mass.

"This is one of the few remaining segments of the router market that's still growing," Hindin observed. "Compatible should do well because it's more concerned with service and support than the bits and bytes performance issues that

drive larger router vendors. And with most businesses trying to cut costs, anything you can get for free assumes greater importance."

The RISC Router 3400R supports all of the major LAN inter-networking protocols including TCP/IP, Novell, Inc.'s IPX,

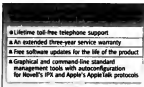
Apple Computer, Inc.'s AppleTalk and Digital Equipment Corp.'s DECnet. It supports industry standard WAN transport protocols such as frame relay and Point-to-Point.

When used with leased data lines or with an Integrated Services Digital Network (ISDN) terminal adapter and an ISDN line, the 3400R supports T1/E1 transmission rates of up to 2M bit/sec.

on its V.35 synchronous ports, according to McConnell.

In addition, the RISC Router 3400R incorporates two synchronous/asynchronous RS-232 ports that support transmission rates of up to 128K bit/sec.

"These ports can be configured for automatic 'fail-over' operation in the event that a V.35 link fails," McConnell said.



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• Free software updates for the life of the product  
• A graphical and command line standard management tools with autoconfiguration for Novell's IPX and Apple's AppleTalk protocols

## Prodigy, Bells team on 'net service

By Elaine Mills  
SAN FRANCISCO

Subscribers to the Prodigy information service in four U.S. cities — Boston, Nashville, and San Jose and Woodland Hills, Calif. — will be able to access the Internet with high-speed Integrated Services Digital Network (ISDN) technology by the end of May, Prodigy executives announced last week.

Prodigy, jointly owned by IBM and

Sears, Roebuck and Co., expects to be the first on-line service provider to offer ISDN service, which uses digital instead of analog lines.

The ISDN service is being offered in collaboration with BellSouth Corp. in Atlanta, Nynex Corp. in White Plains, N.Y., and Pacific Bell in San Francisco. Prodigy is talking with other regional telephone companies about the possibility of offering similar services, and it plans to expand the ISDN offering in the areas covered by the three regional

phone company partners.

The foremost consumer benefit in World Wide Web access, Prodigy officials said:

ISDN will enhance Web browsing and the downloading of text and graphics and will increase access to video clips.

It will not provide real-time video yet, according to Prodigy. It will take about three to four minutes to download a video clip, said Tom Isaacson, director of network planning at Prodigy.

Mills writes for the IDG News Service at its San Mateo, Calif., bureau.

## NETWORKING A look at Microsoft STRATEGIES:

Microsoft's telecommunications infrastructure ties together some 35,000 nodes at 151 sites in 27 countries. It also handles almost 14 million electronic-mail messages per month. The average message is 8.5K bytes. The network's heart is a 300M bit/sec. Fiber Distributed Data Interface (FDDI) network backbone at the company's Redmond, Wash., campus. Within each campus building are LANs, some of which consist of 30M bit/sec. Ethernet networks.

Several additional Puget Sound-area facilities tie in using a combination of FDDI, T1 links and 2.5G bit/sec. Synchronous Optical Network (SONET) as well as Integrated Services Digital Network lines. Other facilities in the U.S. and abroad are connected by a mix of dedicated and dial-up lines, almost all of which are 64K bit/sec. or faster.

A pair of Digital Gigaswitches handle switching for the network. One is kept in "hot standby" mode, while the other carries the switching load. The switches are capable of handling more than 2G bit/sec. of traffic, according to Chris Gibbons, Microsoft's chief information officer.

More than 20,000 of Microsoft's networked PCs are running TCP/IP protocols using the Dynamic Host Configuration Protocol. More are being switched over daily.

Microsoft still maintains on campus a large data center, which houses two Digital VAX clusters running legacy applications, including finance and manufacturing planning software. The data center also houses about 1,500 servers, many of which are four-processor Pentium-based machines used to handle the mammoth volume of E-mail.

As might be expected, Windows NT runs the vast majority of the approximately 3,300 servers on the company's worldwide network. — Stuart J. Johnston

Seawater Corporation is an international organization with 25 offices around the world, thousands of satisfied customers, and products with a proven track record.

## Enterprise Networking

**Thomas-Conrad Corp.** has announced Secra Management System for Windows.

According to the Austin, Texas, company, the Secra Management System lets users diagnose, monitor and manage network resources with Windows-based Simple Network Management Protocol. The product features event and alarm logs and report interfacing.

The Secra Management System costs \$895.

► **Thomas-Conrad**  
(512) 836-1935

**Linksys** has announced LANgate, a remote node server.

According to the Irvine, Calif., company, LANgate is a one-port stand-alone communications node that provides Novell, Inc. networks with remote access and modem sharing capabilities.

Local users can dial out from any network workstation to access on-line services or the Internet. Linksys' Salmon remote PC access software comes bundled with the server.

LANgate costs \$209.  
► **Linksys**  
(714) 261-1288

**Siemens Rolm Communications, Inc.** recently announced the Rolm OfficePoint communication system, an Integrated Services Digital Network (ISDN) system for remote and small offices that need up to 16 telephone lines.

According to the Santa Clara, Calif., company, the Rolm OfficePoint system uses up to three National ISDN 1 Basic Rate Interface (BRI) lines ordered from

a local phone company. OfficePoint allocates the BRI bandwidth and transmits the data at high speeds. Users can access the Internet, hold full-motion video conferences, share screens from remote locations and talk on the phone, all from the same system.

The Rolm OfficePoint system includes six Optimist phones. Pricing begins at \$4,000.

► **Siemens Rolm Communications**  
(408) 492-5000

**Proxim, Inc.** has announced the RangeLink family of wireless remote bridges.

According to the Mountain View, Calif., company, RangeLink products remotely bridge Ethernet LANs in buildings up to three miles apart using frequency-hopping spread spectrum technology.

The bridges include an Ethernet interface, remote bridging software, a directional antenna with mounting pieces and a cable for antenna location.

Prices range from \$2,975 to \$3,725.  
► **Proxim**  
(415) 960-1630

**Miro Computer Products, Inc.** has announced MiroConnect 34 Wave.

According to the Palo Alto, Calif., company, MiroConnect 34 Wave combines fax/modem, telephony, sound and communications on a plug-and-play board. It was designed to automatically distinguish between data, fax and voice input.

MiroConnect 34 Wave is a 16-bit ISA board that can be installed in an Industry Standard Architecture (ISA), Extended Industry Standard Architecture (EISA) or Peripheral Component Interconnect (PCI)-based PC. It is compatible with Windows 3.11 or later and Windows Sound System 2.0.

MiroConnect 34 Wave costs \$349.

► **Miro Computer Products**  
(415) 855-0940

**Microdyne Corp.** has announced ACS 4400, a remote access communications server. According to the Alexandria, Va., company, ACS 4400 features four-port dial-in or dial-out capability and centralized configuration and management.

It comes installed with Novell, Inc.'s NetWare Connect software, which supports DOS, Windows, Macintosh and TCP/IP workstations.

ACS 4400 server costs \$3,695.

► **Microdyne**  
(703) 229-3700

**Pacific Data Products, Inc.** has announced Optiform, a family of printing forms products for Hewlett-Packard Co.'s HP LaserJet 4 printers.

According to the San Diego company, Optiform reduces the need for preprinted forms by providing flexible, electronically printed forms that can be directed and managed across a network. Optiform includes the Optiform Flash Single In-line Memory Module, which installs in the printer's memory slot and increases forms printing speed.

Optiform creates blank form images using most Windows-compatible software programs. It is intended for use in forms-intensive businesses such as the banking, legal, insurance, medical and finance industries.

Pricing for Optiform starts at \$349.

► **Pacific Data Products**  
(619) 552-0690

**Optical Data Systems, Inc.** has announced ODS EtherStack 1105-10ESU, a stackable hub for unmanaged hubs, and ODS EtherStack 1105-10ESM for managed hubs.

According to the Richardson, Texas, company, both products are for stackable hubs and feature an expandable hub concept for ease of scalability. They are designed to improve the network availability by automatically recovering from most network failures.

ODS EtherStack 1105-10ESU for unmanaged hubs costs \$4,490. ODS EtherStack 1105-10ESM for managed hubs costs \$2,240.

► **Optical Data Systems**  
(214) 234-6400

**PC Guardian** has announced Network Security Plus 2.0, a workstation security application.

According to the San Rafael, Calif., company, Network Security Plus 2.0 allows administrators to install, update and change a customized security configuration on any network workstation from a central point or an administrator's workstation.

Network Security Plus 2.0 costs \$895 per server and \$150 per workstation.

► **PC Guardian**  
(415) 450-0190

### Product shorts

**Network Computing Devices, Inc.** has unveiled the HMXpro X Window System terminal. It is based on a 125-MHz MIPS Technologies, Inc. 64-bit R4600 chip. Cost: \$3,495 to \$4,795. Network Computing Devices, Mountain View, Calif. (415) 694-0620.

... **Olympus Image Systems, Inc.** has announced PageFlex 18 Plus, a high-volume printer offering 600 by 600 dots/in. resolution for multilayer environments supporting up to 12 operating systems simultaneously. Cost: \$3,495. Olympus Image Systems, Woodbury, N.Y. (216) 364-3000.

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# Large Systems

LACK OF UNIX MANAGEMENT  
TOOLS IRRIGATES IBM  
EMC EXPANDS SYMMETRIX  
5000 LINE, 84

## Jury still out on AS/400 price moves

Users unclear on savings from new user-based plan

By Craig Stedman

IBM's recent completion of a major revamp of the AS/400 finally thrusts into the limelight a user-based pricing scheme that the company announced a year ago. This gives potential buyers another idea to scrutinize as they compare the AS/400 with its Unix rivals.

Most of a half-dozen AS/400 customers interviewed this month applauded the concept of user-based pricing and And they said they hope the new approach will prove to be more equitable than traditional licensing based on processing capacity.

However, some of these customers are putting off a final review of the pricing changes while they work out all the permutations of upgrading to Version 3 Release 1 (V3R1) of the OS/400 software. Others were skeptical that user-based pricing will give them much relief.

Basing OS/400 prices on the number of users should help customers reduce the big jumps in software costs that usually accompany hardware upgrades under capacity-based licensing, said George Cohn, director of technical services at Reynolds Metals, Inc. in Richmond, Va.

Because Reynolds already exceeds the maximum number of users for which IBM charges, it can add more people to its AS/400s without paying any additional fees, Cohn said. Nonetheless, it is not clear that user-based pricing will yield much in the way of cost reductions, he said. "I think we'll save a little bit, but it's hard to say."

### Undecided users

Other users had similar reactions. "I honestly don't know yet if we're any better or worse off" with user-based pricing, said Marc Cohen, senior vice president of information systems at Enterprise Rent A Car Co. in St. Louis. "It's a tough issue."

Cohn added that OS/400 pricing has gotten "a little more complex" with the advent of the user-based method, especially since IBM slapped together a raft of promotions after users complained that some of the initial prices were too high.

The promotions, which applied to an interim OS/400 release shipped in 1994 with the latest batch of AS/400 hardware, were formalized just prior to the completion of V3R1 in mid-February. IBM created a new entry-level price group and lowered some of the user counts at which prices are capped (see chart).

cost \$23,600 with 50 users and \$23,600 with 70 or more users on an AS/400 P56, according to figures from IBM. The capacity-based price for previous OS/400 releases on that machine was \$10,400.

Such uncertainties about user-based pricing "really bother me," said David Perrell, MIS manager at Norwood Promotional Products, Inc. in San Antonio. "At least, before, you pretty well knew what was going to happen," he said. "Now, you don't really know."

V3R1 and the interim IBM release are the first versions of the OS/400 for which customers must pay an upgrade fee.

Jeff Korpke, its manager at S. C. Johnson & Son, Inc.'s Worldwide Professional Division in Racine, Wis., said he was optimistic that user-based pricing will be beneficial, especially for customers with high-end AS/400s.

But other software developers have been slow to emulate IBM this far, Korpke said. "None of my other vendors has done it yet."

fast change

Low-end pricing for OS/400 Version 3 before and after recent revisions by IBM

PRICE GROUP	AS/400 MODEL	OS/400 SOFTWARE (BASE)	OS/400 SOFTWARE (UPGRADE)	MAXIMUM COST
P40	200, 205	\$500/\$400	75	\$6,500
P45	200, 205	\$400/\$300	5	\$2,000
P40	Higher-end 200, 205	\$250/\$200	15	\$6,500

Glen Van Benschoten, director of systems product management at IBM's AS/400 Division in Rochester, Minn., acknowledged that IBM's first pass at user-based pricing "had a few wrinkles that we had to smooth out."

But some increases are still built into the formula. For example, V3R1 would

## Electronics firm heeds customers

AMP offers on-line access to product information, orders

By Julia King

Ten years ago, electronic components manufacturer AMP, Inc. in Harrisburg, Pa., received 90% of all customer orders via telephone. By 1991, the number had dropped to 62%. More customers preferred to fax their orders, so AMP installed more fax machines for a total of five.

But in 1994, statistics showed that only 61% of customers' faxes were getting through to the manufacturer on the first try. AMP again responded by increasing the number of inbound fax machines to 30. Three months later, another set of measurements revealed that the fax availability rate had jumped to 91.6%.

If you have not figured it out by now, AMP is a company driven—by make that obsessed—by measurements, which in turn drive much of the systems development at its corporate logistics division.

"It is more, we measure it," said Larry Brandt, associate director



### AMP, Inc.

Harrisburg, Pa.

Annual sales \$6.1

Goal is \$6.8 in sales by the year 2000.

Products: Connectors, cable and cabling systems, printed circuit board systems, among other things.

Employees: 20,000 in 35 countries.

Systems: Main ordering and inventory systems run on an IBM MVS mainframe.

Harrisburg Distribution Center runs HP 3000 computers linked to the IBM mainframe.

of customer service. To provide the best possible customer service, "we need to know what's coming at us, how it's coming and how much is coming," he explained.

In 1985, AMP centralized customer service, physical distribution, transportation and several other functions into one single corporate logistics division. The unit's 30-person information systems group has created, among other things, an award-winning automated product information service and a system that lets customers track orders on-line.

### Good report card

Customers give both systems and the service they provide high marks.

"I'd rate AMP very high in customer service," said Andy Piarzski, an inventory management specialist at Antibiot, Inc. in Skokie, Ill.

"The tool we use most often is their dial-up system," Piarzski added. "I can go into the system

and actually see on hand inventories, lead times and pricing. It takes me two seconds to look up an order instead of me asking them to look it up by a purchase order number."

At AMP, a call management system from AT&T Corp. does much of the measuring and number crunching. In addition to routing calls between the company's two main customer service centers in Harrisburg and California, the system measures the number of incoming calls; the number of calls completed before customers hang up; the time it takes to answer a call and complete it; and the number of customer requests that are satisfied on the initial call.

On the systems side, those numbers help pinpoint where new kinds of services might improve overall customer satisfaction, according to Bryan Hoots, manager of systems planning and support.

For example, AMP's IBM LAN-based outbound fax service was developed after statistics gleaned from the call management system identified customers' need for a

fast way to access component specifications on demand.

AMP responded with AMPFAX, a 24-hour toll-free number that customers can use to download product drawings, instruction sheets and component specifications to their fax machines from LAN-based PCs to the corporate logistics division.

In addition to generating statistics internally, AMP solicits performance feedback directly from customers via its Scorecard System. Under this program, customers keep their own AMP performance records, which are regularly compared with AMP's internal performance records.

Without fail, customers consistently rank on-time delivery as their No. 1 priority, Brandt said. In response, AMP developed a forecast demand system, which was written in Cohn and gives customers such as Piarzski on-line access to the company's IBM mainframe-based inventory system. Using the dial-up system, customers can see inventory levels in plain forecasts and orders.

"We deploy technology that we can leverage best to our business," said John Stout, director of logistics systems.

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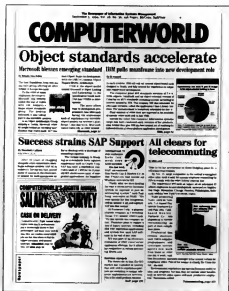
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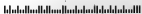
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# Database users seek management tools

Vendors fill utilities void, provide solutions to diverse management tasks

By Kim S. Nash

TRW, Inc., one of the world's largest credit information services, wanted to put a revamped version of its customer credit application on a giant Unix relational database when it started a companywide re-engineering effort in 1982.

However, as work progressed and prototypes were built, TRW had to double back to include IBM's DB2 mainframe database in its configuration, partly due to a relative lack of administration tools for Oracle Corp.'s Oracle7, said Helen McMillan, a database architect at TRW Information Services in Orange, Calif.

In fact, a lack of solid, mature utilities for indexing, backup, recovery and other management tasks is partially to blame for limiting the use of Unix relational databases in very large database scenarios, said David McGovern, an analyst at Alternative Technologies, a consulting firm in Boulder Creek, Calif. Unix relational database makers are realizing that users need utilities to manage, troubleshoot and organize databases, and the tools should be simple and graphical.

Bybase, Inc., for example, hopes to beat that call with with Enterprise SQL Server Manager, an object-based tool designed to oversee Bybase's SQL Server database and scheduled to ship this month. Brewers Retail, Inc. plans to put the product in action by the end of 1993, said Kamran Tabandeh, a systems analyst at the beer distributor in Mississauga, Ontario. It will need to monitor 500 copies of Bybase's SQL Server database on Windows NT, one at each retail store. Brewers operates, Tabandeh said, Enterprise SQL Server Manager "has never crashed on us," he said. Brewers Retail has tested it in a 10-database configuration, he added.

Meanwhile, Oracle officials have promised to ship graphical management

## Help wanted

Graphical database administration utilities that monitor more than one brand of database. Must plug into network management systems. Fee negotiable.

has tested it in a 10-database configuration, he added. Meanwhile, Oracle officials have promised to ship graphical management

products this year. For example, Oracle Network Manager, an Oracle version of Oracle's SQLNet connectivity product, is scheduled for delivery late this year.

Oracle may also start reselling tools from other vendors. The Redwood Shores, Calif.-based database company is talking with Ecosystems, a unit of Ecosystems, Inc. in Framingham, Mass., about reselling the EctoTools line of administration products.

Such a reseller deal would address Oracle's dearth of administration products, said Jamie McGuffie, a product manager at Compuware. No deal has been signed, but Oracle has bought EctoTools to use internally, McGuffie said.

Yet Tabandeh said one crucial piece is missing from these: They offer administration products. They cannot effectively minister to databases from different vendors at the same time.

## Client/server software

# A contender is born

By Rosemary Cafasso

In the race for market share in the client/server manufacturing software arena, Spectrum Associates, Inc. in Woburn, Mass., is barely a contender when compared with the big guys such as Marcus Corp. or SAP America, Inc.

But this \$30 million software company — once a part of the far more famous PowerSoft Corp. — is nonetheless building up a steady customer base.

consulting project manager at the company. "We didn't want to go backward to a rigid software product where you have to install MIS for a report."

While the software may be user-friendly, it is a client/server package, and that typically means difficult installation.

For example, Landis, Inc. in Portland, Ore., one of the first beta sites for the original PointMan, is still not in production with software it received in 1993. "It has been slow and painful, and we aren't even live yet," said

Andy Gask, vice president and chief operating officer at Landis.

"A lot of it is our doing. The biggest issue has been speed and response time, especially with our order."

Gask said Landis has not forced Spectrum to resolve response time problems more quickly because it is not rushing to

make a full switch to client/server. Landis uses Spectrum's other software package, GrowthPower, which continues to run "like clockwork," Gask said.

Tectron Defense Systems, a division of Tectron, Inc., also chose PointMan for its flexibility and ease of use.

Long & Bradstreet Software customer. Tectron evaluated 26 client/server software packages last year and chose Spectrum, said Michael Taft, an executive for information technology at the Wilmington, Mass., defense contractor.

Taft said both companies met three requirements, including the need for a real client/server architecture, but Spectrum won because its software was ready when D&B Software's was not.

# EMC boosts low-end storage

By Craig Stedman

Looking to keep a grip on the small mainframe shops that were its stepping-stone into the mainframe disk business, EMC Corp. recently expanded its Symmetrix 5000 product line by adding a faster low-end array that supports up to 1984 bytes of data.

The Symmetrix 5100 expands on the 900-byte capacity of EMC's 4800 low-end device and adds support for Eecoo I/O channels. It also can be configured using EMC's new RAID-5 redundancy technology which was introduced at the same time along with several other products (see chart).

## Back to the future

The 4800 and other early Symmetrix arrays targeted users of small mainframes as EMC tried to gain a foothold in the System/390 market. But during the past couple of years, EMC focused more on larger shops to fuel its dazzling growth, and analysts said the 4-year-old 4800 began showing signs of age.

Jose Nunes, director of technical planning for information technology at Time Warner, Inc.'s Home Box Office (HBO)

business unit in New York, said HBO got a two-thirds performance improvement after it switched a satellite TV subscription application from a 200-byte 4800 to a 510-byte 5100 in February.

The 5100 is cranking out about 500 I/Os per second, compared with 300 I/Os per second on the 4800, said Nunes, who got the 5100 as a beta tester. That has given HBO's telemarketing representatives faster access to the satellite customer data stored on the Symmetrix bus, he said.

The 5100 uses the same 90-byte disk drives that EMC builds into its bigger 5200-0 and 5500-0 arrays. Maximum capacity would be 696 bytes with full disk mirroring or 1052 bytes with RAID-5, the 1396-byte limit applies if remote mirroring is used, he said. Cache capacity ranges from 512M bytes to 2G bytes.

Market research firms project that EMC will surpass IBM as the leader in mainframe disk shipments this year (CW, April 17). EMC's ability to deliver on new products such as the 5100 and RAID-5 "underwrites why EMC has been and continues to be so successful," said Robert Callery, an analyst at International Data Corp. in Framingham, Mass.



Source: Advanced Manufacturing Research, Inc., Boston

"This is clearly one to watch," said Bruce Richardson, an analyst at Advanced Manufacturing Research, Inc. in Boston.

Last week, Spectrum launched Release 2.0 of PointMan. Its client/server suite of manufacturing and financial applications. Designed as a client/server platform from the ground up, PointMan is an easy-to-use graphical and flexible set of software modules, some early users said.

Presstek, Inc. in Hudson, N.H., which designs imaging systems and other printing equipment, selected PointMan because it allows users to "create your own reports and get access to the database," according to Philip Michaels, a

## Storage pompage

EMC's April product announcement included the following additions to its Symmetrix line:

Product	Features	Availability	List price
RAID-5	RAID Level 5 hybrid for data redundancy	May	Included in base microcode
Symmetrix 5230-4	3636-byte array based on new 46-byte drives	Immediate	\$36,000 to \$17M
Symmetrix Remote Data Facility Extended Distance	Disk mirroring across separate locations at unlimited distances	Immediate	\$45,000 to \$25,000
Symmetrix Manager	GUI-based software for tracking configuration and performance data	June	\$15,000

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- ☐ Software Engineer
- ☐ Programmer
- ☐ Manager of Technical Staff
- ☐ Programmer
- ☐ Engineer (other than software)
- ☐ Software Tester
- ☐ Business
- ☐ Consultant
- ☐ Other

## D. Number of employees at your company:

- ☐ 0-99
- ☐ 100-499
- ☐ 500-999
- ☐ 1000-4999
- ☐ 5000-9999
- ☐ 10000-49999
- ☐ 50000-99999
- ☐ 100000+

## E. Which location do you prefer to attend the show?

- ☐ San Francisco
- ☐ New York
- ☐ Los Angeles
- ☐ Chicago
- ☐ Dallas
- ☐ London
- ☐ Other

## G. Which of the following object-related products or services are you interested in?

- ☐ C++
- ☐ Eiffel
- ☐ Frameworks
- ☐ Analysis and Design Tools
- ☐ Visual Programming
- ☐ Prototype GUI Builders
- ☐ Development Environments
- ☐ Distributed Management
- ☐ Facility
- ☐ Class Libraries
- ☐ Databases
- ☐ Other

☐ Check here if you are doubtful. Please attach a written description of your needs.

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in January of 8



UPDATE  
No. 7



## Large Systems

Conner Storage Systems, a division of Conner Peripherals, Inc., has announced the CR12-RAID and CR6-RAID subsystems supporting Microsoft Corp. Windows NT.

According to the Lake Mary, Fla., company, the RAID hardware arrays boost Windows NT performance through a PC

board that controls the subsystem and employs a dedicated array processor to off-load RAID algorithms from the Windows NT server. The storage capacity for the CR12-RAID and CR6-RAID systems ranges from 40 to 240 bytes. Both products are available for Extended Industry Standard Architecture or Peripheral Component Interconnect configurations.

Pricing for the CR12-RAID and CR6-RAID subsystems starts at \$8,375.

### ►Conner Storage Systems (407) 263-3500

Asten International, Inc. has announced Case-1, a high-performance, case-based reasoning system.

According to the Chalfont, Pa., company, Case-1 uses intelligent statistical manipulation, indexing, fuzzy logic and pattern matching to compare a problem or description with a case database. Case-1 matches up the elements and displays

the most appropriate solutions ranked by statistical weighting. It is compatible with Astex's Powerleap, which populates a Case-1 session with information required to perform the search.

Pricing is based on the number of concurrent users and begins at \$89 per month.

### ►Asten International (215) 822-8888

Baber Information Services, Inc. has announced Reveal Hardware & Configuration Manager, client/server software for the IBM AS/400 data center manager.

According to the Irving, Texas, firm, Reveal Hardware & Configuration Manager has two modules: The Hardware Asset Module for tracking hardware inventory and the Configuration Management Module for configuring AS/400 devices from a Windows-based PC.

Pricing for Reveal Hardware & Configuration Manager starts at \$495.

### ►Baber Information Services (214) 357-1678

Hadax Electronics, Inc. has introduced the Integrated Services Digital Network (ISDN) 6.2 Multi-Backup Unit (MBU).

According to the South Hackensack, N.J., company, the ISDN 6.2 MBU constantly monitors six channel-service unit/data-service unit lines running at speeds of up to 64K bit/sec. If a line fails, the MBU backs it up through ISDN and maintains continuous communication.

Two 64K bit/sec. lines can be recovered simultaneously or one 128K bit/sec. line can be recovered using bonding protocol.

Pricing for the ISDN 6.2 MBU starts at \$3,295.

### ►Hadax Electronics (201) 807-1150

Mountain Network Solutions, Inc. has unveiled Personal DAT (digital audio tape), a high-speed, high-capacity tape backup system.

According to the Scotts Valley, Calif., company, the Personal DAT system provides a data transfer rate of up to 25MB bit/min. and stores up to 30 bytes of compressed data or 40 bytes of compressed data. Systems can be designed to allow users to increase the capacity of their backup systems.

The 40-byte internal version of Personal DAT costs \$1,599. The external version costs \$1,699 and includes an enclosure and power supply.

### ►Mountain Network Solutions (405) 436-6650

Yanick Software, Inc. has announced UniVerse, a relational database management system for IBM's symmetric multiprocessing RS/6000 PowerPC-based servers running AIX 4.

According to the Westboro, Mass., company UniVerse's multidimensional architecture allows for associations of data fields with multiple values and supports query-intensive applications.

Pricing for UniVerse begins at \$435 per user.

### ►Yanick Software (508) 395-3585

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# Application Development

DEVELOPMENT TOOLS TAKE ON  
CODE GENERATION, 93  
THREE STEPS TO  
BETTER SERVICE, 96

## Delphi gives Visual Basic a run for its money

By Timothy L. Trimble

Facing an uphill battle to recapture developer allegiance from Microsoft Corp.'s Visual Basic, Borland International, Inc. is banking on its Delphi for Windows 1.0 application development package. According to Borland, Delphi for Windows can run code 10 to 20 times faster than its competitor.

The package is also loaded with a large array of predefined forms, templates and controls to position it as a rapid application development tool.

Besides having to overcome the popularity of Visual Basic, Delphi for Windows is limited by its own biggest weakness: The package does not include a language reference manual. This may be a statement of Borland's confidence in the product's ease of use, but the lack of a reference manual was a major complaint raised by programmers in discussions on the Internet—especially for those unfamiliar with Pascal. The manual is available for an additional cost of \$55.

### Reporting deficiencies

Another significant weakness is ReportSmith, Delphi's database reporting and query tool. ReportSmith is written in its own Basic-like language and can be controlled by Object Pascal via Dynamic Data Exchange. But it would have been easier if the reporting tool were more tightly integrated with the product.

Delphi for Windows is composed in the Pascal-based Delphi language, which uses a tool- and control-based interface to provide an integrated development environment. Anyone who has used Visual Basic will be very comfortable with the Delphi Integrated Development Environment, but this is where the similarities end.

The package's biggest attraction is its ability to compile code into a true machine-executable program without requiring runtime Data Link Libraries (DLLs). This feature enables Delphi for Windows to run code 10 to 20 times faster than code that relies on external DLL functions and interpretive Visual Basic code.

Another strength is the use of Object Pascal as the

programming language. While both Pascal and Basic originated as languages for teaching programming, Pascal usually is implemented as an interpreted language, while Basic is often used as an interpretive language.

With Object Pascal, users can develop tools such as Visual Basic controls (VBX) and DLLs. The irony is that this capability could enable Delphi for Windows to develop controls for Visual Basic to use.

Delphi for Windows contains 79 predefined objects in what Borland calls a Visual Component Library (VCL),

are all fully supported.

Borland also provides Delphi for Windows users with a wealth of database and SQL support by including the Borland Database Engine (BDE) and its Local Interface Server. The BDE provides connectivity to Borland's dBase and the Microsoft standard Open Data Base Connectivity (ODBC), ASCII and the Local Interface Server.

The Local Interface Server included with Delphi for Windows is a single-user, ANSI SQL-compliant, Windows-based version of the Borland Interface SQL server product. This runs as a local SQL server on the Windows desktop.

### SQL support

Borland has a separate Delphi Client/Server product that provides support for native SQL drivers for Microsoft's SQL Server and Borland's Interbase as well as databases from Oracle Corp., Sybase, Inc. and Informix Corp.

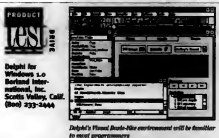
ReportSmith supports Borland's Integrated Database Application Programming Interface, ODBC and native database connectivity. A runtime module for ReportSmith is provided for application distribution.

Delphi for Windows will likely attract a lot of attention from serious Windows developers. With the ability to create self-contained executables and controls for other applications, the package is the perfect tool for anyone who is limited by Visual Basic but does not have the patience for C++ development.

It may be tough to compete with the product integration of the Visual Basic language in Microsoft's products, but Delphi for Windows should make a dent in the Windows application development marketplace. It will at least live alongside Visual Basic as a control development tool.

Delphi for Windows 1.0 is priced at \$190.95 until May 31, after which the cost will be \$250. CD-ROM delivery is available.

Trimble is a senior business analyst at ESI at Hunter Industries in San Marcos, Calif. He can be reached via the Internet at trimble@esi.wm.edu.



■ Delphi for Windows 1.0 is an application development environment for Windows that runs faster than Microsoft's Visual Basic. It enables developers to quickly create self-contained executables and controls for applications.

■ Weaknesses include a database reporting and query tool that is written in a proprietary language and is thus less integrated with Delphi than it could be. The product does not include a language reference manual. Buying it separately is a hassle for non-Pascal savvy programmers.

These objects are made up of database controls, buttons, list boxes, grid controls and multimedia controls. The VCL can be expanded to include most third-party VBXs and DLLs.

Microsoft's OLE 1.0 and 2.0 are supported via OLE container objects. OLE allows desktop applications to be launched from within other applications. The object-oriented attributes of Object Pascal enable users to create reusable objects that can be used in other applications. The standard object-oriented architecture of polymorphism, inheritance and encapsulation

## DCE comes into its own—gradually

By Steve Moore  
ANJDEB, CALIF

New third-party applications and automated development tools appear to have calmed users' fears about the cost and complexity of Distributed Computing Environment (DCE) middleware.

"I'm glad to see that DCE is much more of a mature technology than I first thought," said Matthew Lodato, a systems analyst at Hughes Information Technology Corp. in Boston, Va., at the recent Open Software Foundation (OSF) conference here.

Compared with alternative distributed computing technologies, such as vendor-specific solutions, Lodato said, DCE "is the only solution to this problem of

getting heterogeneous applications and platforms to work together and cooperate."

Another user likened the DCE learning curve to that of IBM's SNA. "It took four or five years to become proficient in SNA, and we were afraid of that," said Michael J. Danley, a distributed computing specialist at Motorola, Inc. in Scottsdale, Ariz.

### Just about ready

While Motorola has been tinkering with DCE for four years, he said, the firm has completed the proof-of-concept and pilot stages, developed its client and server code and expects to have DCE applications in production by the third quarter.

"We all know DCE isn't a utopia just yet,

### Technology defined

#### DCE

The Distributed Computing Environment (DCE) is middleware that glues together applications distributed across multivendor computer networks. With DCE, a single-log on enables an end user to reach data on any desktop, midrange or mainframe DCE server without knowing the server's location or how to navigate to it.

#### Kerberos

Kerberos is a cryptography-based computer and network security technology that sprang from Project Athena, a research project at MIT. Kerberos uses encryption to authenticate log-ons and service requests.

there are more than enough tools out there and more than enough people who are willing to help you," Danley added.

Analysts said DCE's Kerberos security features will attract users, especially now that IBM, Hewlett-Packard Co. and Digital Equipment Corp. are embedding DCE into their operating systems.

"People want security so badly that it is one impetus for integrating distributed system [environment] using DCE," said Andrew H. Heston, a server program manager at Input, Inc., a market research firm in Mountain View, Calif.

DCE, page 88

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## Briefs

## CA names trainer

Computer Associates International, Inc. has designated Learning Tree International in Boston, Va., as the trainer for clients of its CA-Virtual Reality and CA-Realis II Workbenches, CA's PC-based Cobol application development package.

## Less testing

A KPMG Post Merit study examining the use of automated software testing tools has found that small firms use them less often than larger companies. Among companies employing 25 or fewer people, only 29% used testing tools; at companies with 26 to 100 employees, 50% used them. Testing tools were found at 74% of companies with more than 100 employees. According to researchers, this probably indicates that larger companies are developing more sophisticated systems that are more difficult to write and whose failure would be devastating to the business.

## Ontos' object translator

Object database maker Ontos, Inc. in Burlington, Mass., announced an object translator for Oracle Corp. databases. The translator is the first of a series that Ontos is creating to map objects to relational database structures.

## Development tools take on code generation

By Elizabeth Heibler

If fully automatic code generation is the holy grail of object-oriented software development, then crusaders riding under the Shlaier-Metlor banner are back from Jerusalem, cup in hand.

This spring, Objective Spectrum, Inc. in Cary, N.C., and Scientific and Engineering Software, Inc. (SES) in Austin, Texas, added code-generation functions to software development tools that implement the Shlaier-Metlor object-oriented methodology. Invented by Sally Shlaier and Steven Metlor, the methodology is one of several that guide developers through designing and building object-oriented applications.

Corporations are turning to the Shlaier-Metlor methodology even though it can be difficult to use.

## Generation benefits

Of the various object-oriented software development methodologies, the Shlaier-Metlor method is particularly rigorous and requires adherence to a strict discipline, according to users who have evaluated it. While it has been used most heavily in real-time and technical applications, its proponents maintain that it is equally well suited for commercial and information systems applications.

Where the rigor of the method pays off is in the area of code generation, according to Mark Lloyd, chief technology officer at Objective Spectrum.

Theoretically, code generation is possible with any method. Under most methodologies, however, since the code has been generated, it is separated from the analysis model, and any changes to the

application must be made in the code itself, Lloyd explained. The Shlaier-Metlor method, by contrast, permits code regeneration, which allows a developer to make changes to an application at the higher level of the analysis model.

Nigel Beck, vice president of architectures at Footprint Software, Inc. in Toronto, is a beta user of Objective Spectrum's BridgePoint 3.0 and is using the code regeneration facility. Footprint develops software for the financial services industry. Its product, Visual Banker, is a generalized retail front end for banking, insurance and brokerage.

Using BridgePoint 3.0's code regeneration facility, Footprint can deliver customized software in Smalltalk to each of its customers by modifying the graphical models, Beck explained. "This has significantly speeded up our development time, and the code works," he said.

Another strength of Objective Spectrum's product is that it breaks the applications development process into two sections — application modeling and software implementation architecture — according to David Kelly, a senior consultant at Hurwitz Consulting Group, Inc. in Watertown, Mass. This means that the software implementation architecture — the actual platforms and environment in which the application will be de-

veloped — can be changed without affecting the application produced by an analysis model, he explained. This saves time at the code-generation stage as well.

Tools supporting the Shlaier-Metlor method also allow applications to be broken into pieces called domains, making it easier for teams to work on large ap-

Oncoming objects			
New object-oriented tools feature code generation			
Product/ Vendor	BridgePoint 3.0 Objective Spectrum Cary, N.C.	SES/Objectbench Scientific and Engineering Software Austin, Texas	
Based on	Shlaier-Metlor method	Shlaier-Metlor method	
Code generated	C, C++, Smalltalk, SQL and Ada	C++	
Pricing	\$6,000 (analysis module); \$20,000 (simulation module); \$15,000 (code generation module)	\$4,500 (simulation module); \$4,500 (analysis and code- generation module)	

lications and for big problems to be isolated, said Leslie Segal, a consultant using Scientific and Engineering Software's SES/Objectbench for a project at AT&T Consumer Information Services in Pleasanton, N.J.

SES will today ship SES/Objectbench 2.1, which includes code generation for C++, according to the company. The software runs on Unix workstations from Sun Microsystems, Inc., Hewlett-Packard Co. and IBM.

Objective Spectrum's BridgePoint 3.0, available now (see chart above), runs on Sun, HP and Silicon Graphics, Inc. workstations.

## DCE

CONTINUED FROM PAGE 59

DCE's Kerberos security technology, coupled with the DCE's Distributed File System, "is the real reason we bought a [DCE] server license and 30 clients," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co. in Newark, Del.

## Interoperability benefits

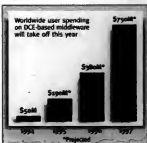
Other users said they are pleased with DCE's cross-platform interoperability.

"We used DCE to create program-to-program applications running on two Unix platforms — DEC OSF/1 and HP-UX — and I was amazed when they interoperated, so the [DCE] story is true," said a database specialist at a major West Coast oil company.

Hughes Information Technology is testing several vendors' DCE implementations "to see if we can get them to work together," Lodato said. "Open systems is a vendor means their solution across all platforms," he said, adding

that DCE will allow Hughes to diversify its systems "and not go with one vendor all the way."

While the OSF had set an unduly high pricing structure for DCE software, "that has now gone away with IBM and HP putting DCE into their operating systems and with companies developing tools



that allow you to much more easily build DCE applications," according to Judith Hurwitz, president of Hurwitz Consulting Group, Inc. in Watertown, Mass.

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Robert Chapman

### Three steps to better service

Information systems is choking from its own success.

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All those previous attempts to conquer that problem—having better compilers and languages, structured programming and design, CASE, object-oriented programming and system development methodologies—have failed.

Even worse, PC development projects are starting to experience a declining service level between IS and its many client groups. And the problem appears to be getting worse each year.

Once in a while, a project does come in on time and under budget and uses some sort of new technology—either a new language (C, for example), a new programming metaphor (structured programming) or a new development methodology (object-oriented).

Unfortunately, subsequent projects using these same tools fail to come in on schedule and within budget.

#### Problems defined

Two reasons are behind the declining service levels we see in IS. The first is the increasing complexity of the applications we develop. The second is the ability of any organization to retain expertise as time goes by.

Each change to an application or system environment increases its complexity. The relative expertise level of IS organizations declines whenever a new system is implemented or personnel leave.

Relative expertise at an organization is a measure of the experience of the staff and the organizational structure compared with the complexity of the systems supported.

Understanding the two components of this problem will allow management to take concrete steps toward reversing the decline and increasing the service level.

To address the problem, complexity in the systems environment and applications must first be reduced.

Second, the expertise of the staff and supporting organizations must be increased. Management must stop their development and support teams from implementing complex solutions to problems that arise during development.

Increased functionality should not be implemented until it is actually needed.

Solutions based on "high-tech computer science" should not be allowed when simpler technology can do the job. Overly complex or unneeded functionality should be removed from applications and tools.

#### In-house changes

Expertise must be increased within the organization. As part of this effort, management must stop hiring contractors and start hiring employees. This step alone will increase staff expertise. Education dollars should be concentrated on training staff in the company business.

The organizational structure must also be changed to ensure that expertise can be maintained. Documentation needs to be accurate, complete and readable.

The bottom line is this: If an IS organization reduces the complexity of its products and services, hires employees instead of contractors and structures itself to retain knowledge, the overall service level to its clients will increase.

If an IS organization does not do these things, it will soon be outscored.

Chapman is owner of Chapman and Associates, a consultancy in Aliso Viejo, Calif.

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# Fujitsu plans U.S. launch of object database

By Ron Condon

Fujitsu Ltd. has launched its ODB-II object database in Europe and plans to release the product in the U.S. this month.

The company will use ICL, the British systems manufacturer in which it holds an 84% stake, to manage marketing in

Europe. ICL will collaborate in customizing the product for local markets.

ODB-II consists of a kernel database engine, a graphical development environment called ModelWorks and several class libraries, including multimedia and document management. It also includes interfaces to C, C++, Microsoft

Corp.'s Visual Basic and Oracle Corp.'s databases.

Support for other databases will be added as demand dictates, said Dan Fishman, vice president and general manager of Fujitsu's Object Software division.

The product allows companies to store

and query unstructured and multimedia data easily, Fishman said. It was designed to handle industrial-scale systems.

ODB-II was launched in Japan last February after eight years of development and has 300 users there, including automaker Mazda Motor Corp., where it handles document management; a nuclear facility, where it drives a multimedia kiosk for the public; and a pharmaceutical company, where it manages clinical trials.

"There is a lot less code to write since all the semantics are defined in the object base," Fishman said.

ICL has developed a prototype system using ODB-II, called the ICL Publishing Content Store, to help companies manage information for delivery over the World-Wide Web. The system manages changes to the information and controls access and charges to users.

"ICL sees potential applications for ODB-II in any area where the data is too complex to be stored conveniently in tables," said Mike Kay, an ICL company architect.

Potential applications could be multimedia publishing, geographic data systems and network modeling, Kay said. "These are all areas where relational technology is inadequate," he said.

The software runs on Hewlett-Packard Co.'s HP-UX, Sun Microsystems, Inc.'s Solaris and Novell, Inc.'s UnixWare. A Microsoft Windows NT version is under way at ICL's development center in Dublin. A version for IBM's AIX is also under development.

The product is available now throughout Europe from ICL. It will be launched in the U.S. by Fujitsu Open Systems Solutions, Inc. in San Jose, Calif.

Condon writes for the IDG News Service's London bureau.



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MainSoft Corp. has announced MainWin Test, an automated software tool for testing Windows applications ported to Unix platforms.

According to the Sunnyvale, Calif., firm, MainWin Test lets developers support multiple operating systems from a single source code base by providing the Windows application programming interface on all major Unix platforms and supporting Windows applications with underlying native Unix performance.

Platforms for MainWin Test include Sun Microsystems, Inc.'s Solaris 2.x and SunOS 4.1.3, Hewlett-Packard Co.'s HP-UX 9.x and IBM's AIX 3.x.

MainWin Test costs \$5,000 for the first license, with price reductions for multiple licenses.

► MainSoft  
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More new products, page 101



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#### ***The Means to Make Better Decisions***

Providing the means to deliver accurate and timely information to improve work processes and make better business decisions is the job of George Alameda, Chevron U.S.A. Production Company's Manager of Information Technology.

The company is using the SAS System to help with enterprise-wide information delivery. "Our mission is to make financial, operational, and reservoir data available in an easy-to-use format to all the asset teams at work in CUSA Production Co.," says Alameda. "We've found the SAS System is a superior solution for analyzing data, turning data into useful metrics, and guiding our cross-functional teams toward improved work processes."

One team, in CUSA Production's Western Business Unit, is tracking the profitability of individual wells. "It's a tremendously difficult task to optimize our field operations for maximum profitability," says Alameda. "With the SAS System, we can integrate large amounts of data and build a picture to compare one field against

another and challenge our asset teams to identify and share best operating practices."

#### ***Reaching for the Best***

Alameda looks forward to extending the use of the metrics and performance monitoring data to employees trying to improve their work processes. He admits his vision is far reaching, but so is the SAS System. "Our challenge is to be better than

the best," he concludes, "and the SAS System is helping us reach that goal."

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## Application Development

Objectshare Systems, Inc. is now shipping WindowBuilder ProV 2.0, an application builder for Digital, Inc.'s Visual Smalltalk 3.0.

According to the San Jose, Calif., company, WindowBuilder ProV 2.0 can generate ViewManager and Application Coordinator subclasses. It also provides productivity tools to build user interfaces in Visual Smalltalk and Visual Smalltalk Enterprise.

WindowBuilder ProV 2.0 is available for Windows and OS/2. It is priced at \$495.

► **Objectshare Systems**  
(408) 970-7280

Netwise, Inc. has announced TransAccess Application/Integrator Workbench 2.0, a Windows-based enterprise middleware product for the Netwise TransAccess Application/Integrator.

TransAccess Application/Integrator Workbench 2.0 uses a Windows graphical user interface to guide developers through the design and generation of process-to-process interactions for enterprise applications.

According to the Boulder, Colo., firm, the product allows developers to graphically build reusable definitions of desktop or midrange interactions with IBM's mainframe CICS or IBM TM Cobot transactions. It also provides integration with Microsoft Corp.'s Visual Basic and offers support for 32-bit Dynamic Link Libraries and Watcom International Corp.'s C/C++ compiler.

TransAccess Application/Integrator Workbench 2.0 is a front-end tool priced at \$600.

► **Netwise**  
(303) 442-5260

NeuralWare, Inc. has introduced NeuralWorks Predict 1.0, an automated tool for neural network application development.

According to the Pittsburgh company, NeuralWorks Predict 1.0 lets users quickly develop neural network solutions with little or no knowledge of nonlinear neural network technology.

NeuralWorks Predict 1.0 has helped users develop applications in market timing, medical diagnosis, process modeling, futures market trend prediction and automated underwriting.

The primary interface for NeuralWorks Predict 1.0 is Microsoft Corp.'s Excel. It requires Windows 3.1 or 3.11

running in enhanced mode.

NeuralWorks Predict 1.0 is priced at \$895.

► **NeuralWare**  
(412) 787-8222

Vixie Software, Inc. recently announced Galaxy Application Environment 2.5 for distributed, object-oriented application development.

According to the Reston, Va., company, Galaxy 2.5 provides distributed develop-

ment features, including a visual datatag editor, a datatag iterator and distributed help services.

The product is available for Unix, OpenVMS, Microsoft Corp.'s Windows and Windows NT, Macintosh and OS/2 platforms.

Galaxy 2.5 costs \$9,000 per C developer seat and \$12,100 per C++ developer seat.

► **Vixie Software**  
(703) 758-8230

HyperAct, Inc. has announced Paster 2.5, an application script language for Borland International, Inc.'s Delphi, Pascal and C++.

According to the CoraVile, Iowa, firm, Paster 2.5 lets users create user-configurable and extendable applications, scriptable macros and expression evaluation.

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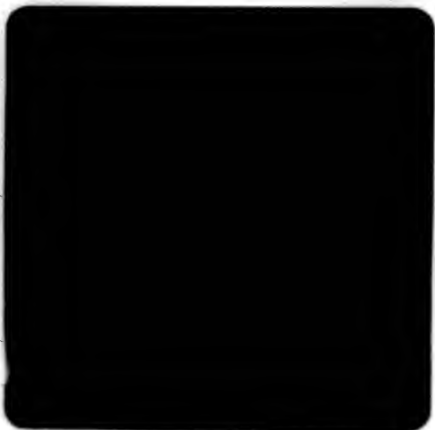
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# Management

By David Weldon

**Computer literacy isn't enough.**  
IS managers and pros need **emotional literacy** to build teams and work well with users. The Myers-Briggs method of deciphering personality types can help IS and users achieve . . .

## A MUTUAL UNDERSTANDING



**W**hen it comes to personality types, opposites don't always attract.

Madeline Welton recalls a chief information officer and chief financial officer at a large manufacturing company who were forever locking horns.

"The CIO was an extrovert and was always publicizing his successes. He was very focused on results and very deadline oriented," says the Bethesda, Md.-based consultant who heads the Society for Information Management's advanced practices council. In contrast, "the CFO was an introvert. He wasn't into planning, and he wanted to keep his options open. It was difficult for IS to get him to sign off on things."

Sound familiar?

It's a scenario that is played out daily at many companies when people of very different personalities are forced to work closely together. And as companies rely more heavily on project teams and expect employees to partner with their customers, opportunities for conflicts abound.

As a result, companies are placing greater emphasis on training tools designed to strengthen people and social skills, such as the Myers-Briggs Type Indicator (see chart, page 104). Information systems managers at Corning, Inc., Armstrong World Industries and New York University Medical Center, among others, have used Myers-Briggs for basic team building. But many others haven't realized its value—particularly in helping to earn the respect and trust of users. Others fail to follow through on initial Myers-Briggs training; as a result, any value is quickly lost.

Used correctly, Myers-Briggs is a Myers-Briggs, page 104

## PERSONALITY BUILDING

**The Myers-Briggs Type Indicator** defines eight basic personality preferences and 16 basic personality types, which are derived from these preferences. Everyone has all of these characteristics but naturally prefer certain ones. The eight preferences and the 16 personality type combinations they form are:

### EXTROVERSION

Drawing energy from the outside world of people, activities or things.

### INTROVERSION

Drawing energy from one's internal world of ideas, emotions or impressions.

**SENSING**-Taking in information through the five senses and noticing what is actual.

**INTUITION**-Taking in information through a "sixth sense" and noticing what might be.

**THINKING**-Organizing and structuring information to make decisions in a logical, objective way.

**FEELING**-Organizing and structuring information to make decisions in a personal, value-oriented way.

**JUDGING**-Living a planned and organized life.

**PERCEIVING**-Living a spontaneous and flexible life.

Source: Center for Application of Psychological Type, Cambridge, Ma.

Type	Slogan	Traits	Characteristics	Related careers	Related fields
<b>INTROVERSION AND SENSING TYPES: "Thoughtful realists (Knowledge is important to establish truth)"</b>					
<b>ISTJ</b>	Doing what should be done	Most responsible	Organizer Compulsive Private	Police officers Steelworkers Accountants	Artists Entertainers Musicians
<b>ISTP</b>	Ready to try anything once	Most pragmatic	Very observant Cool & aloof Unpredictable	Farming Air Force Coal mining	Detectives Dentistry Clergy
<b>ISFJ</b>	A high sense of duty	Most loyal	Amiable Works behind the scenes Accountable	Clergy Nursing Teaching (grades 1-12)	Marketing Human resources Consulting
<b>ISFP</b>	Sees much but shares little	Most artistic	Sensitive Unassuming Team player	Bookkeeping Carpentry Storekeepers	Psychiatry Acting Engineering
<b>INTROVERSION AND INTUITION TYPES: "Thoughtful innovators (Knowledge is important for its own sake)"</b>					
<b>INFJ</b>	An inspiration to others	Most contemplative	Reflective Quietly caring Creative	Clergy Architecture Media	Surveying Sales Child care
<b>INFP</b>	Performing noble service to aid society	Most idealistic	Strict personal values Seeks inner order/peace Creative	Artists Journalism Entertainers	Computer operators Purchasing Consulting
<b>INTJ</b>	Everything has room for improvement	Most independent	Theory based Skeptical Need for competency	Architecture Computer professionals Law	Cleaning service Reception Nursing aides
<b>INTP</b>	A love of problem-solving	Most conceptual	Challenges others Absent-minded professor Socially cautious	Entertainment Computer programmers Management	Clergy Typists Police officers
<b>EXTROVERSION AND SENSING TYPES: "Action-oriented realists (Knowledge is important for practical use)"</b>					
<b>ESTP</b>	The ultimate realist	Most spontaneous	Unconventional Fun Gregarious	Marketing Auditing Service work	Religious education Electronics Photography
<b>ESTJ</b>	Life's administrators	Most hard charging	Order and structure Social Opinionated	Management Purchasing Teaching (trade)	Editors Artists Counselors
<b>ESFP</b>	You only go around once in your life	Most generous	Sociable Spontaneous Loves surprises	Child care Reception Recreation	Clergy Engineering Law
<b>ESFJ</b>	Host and hostess of the world	Most harmonizing	Gracious Good interpersonal skills Thoughtful	Clergy Hairdressing Medical secretary	Acting Architecture Computer professionals
<b>EXTROVERSION AND INTUITION TYPES: "Action-oriented innovators (Knowledge is important for creating change)"</b>					
<b>ENFP</b>	Giving life an extra squeeze	Most optimistic	People oriented Creative Seeks harmony	Social work Counseling Journalism	Chemistry Farming Computer specialists
<b>ENFJ</b>	Smooth talking persuader	Most persuasive	Charismatic Compassionate Sees possibilities for people	Clergy Teaching Acting	Computer specialists Farming Management
<b>ENTP</b>	One exciting challenge	Most inventive	Argues both sides of a point Brimsmanship Tests the limits	Photography Marketing Sales	Factory supervisor Artists Steelworking
<b>ENTJ</b>	Life's natural leaders	Most commanding	Visionary Gregarious Argumentative	Consultants Law Human resources	Detectives Bookkeeping Hairdressing



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# MIND



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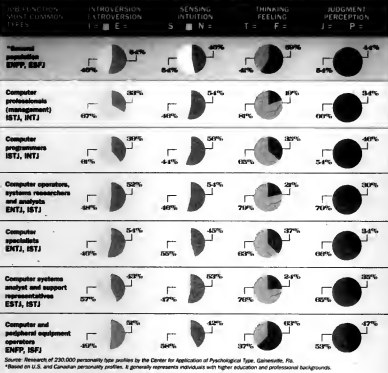
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## IS TYPES VS. GENERAL PUBLIC

IS disconnect? You bet. IS managers are even more introverted than their staffs and the general public. But it's with feelings that the gap really widens.



## Myers-Briggs

CONTINUED FROM PAGE 103

method for measuring and understanding individual personality types. It can reveal how people prefer to receive information, how they form opinions and how they communicate. Myers-Briggs is now the most popular tool used in the workplace for analyzing personality types, according to management consultants.

The reason: The Myers-Briggs method is backed by reams of hard data. Its profiles of which personality types are attracted to which specific occupations, for instance, are based on 230,000 profiles gathered over 40 years by the Center for Applications of Psychological Type (CAPT) in Gainesville, Fla. — a nonprofit clearinghouse for Myers-Briggs data.

"Myers-Briggs helps tell people what personality types they are, what others are, how you react to others and how they react to you," says Robyn Alsop, manager of IS development at Armstrong World Industries in Lancaster, Pa. "It

gives people information they may not have thought about, but it's information that is important to have. To be successful in IS today, you have to have these soft skills."

IS and non-IS managers use Myers-Briggs data to help select the best employees to interact with users or who evaluating the members of a project team. By knowing the preferences of the team members, a manager can ensure the team has the right blend of personality types to accomplish the objective. And Myers-Briggs can help team members become aware of their strengths and potential weaknesses in working together.

"Companies often bring in administrators because they have teams that aren't getting the work done. They want to get past the personality problems," says Roxanne Emmerich, president of Emmerich Training and Consulting in Minneapolis and author of *Finding Solutions to Workplace Problems: A Team's Guide to Using Myers-Briggs*.

Non-IS managers have found other uses for Myers-Briggs training. They have long hired Myers-Briggs consultants to

promote "emotional literacy" — the ability to understand other people's behavior and motivations.

Executives outside IS have also learned the value of Myers-Briggs in helping managers understand how others react to their personality styles. This includes assumptions others may make about whether their views are being understood and respected.

This can be a critical insight for IS professionals, who are often viewed as being disconnected from users and the business vision.

"The biggest challenge for IS is to understand what the customer needs to do in the business," says Tom Clark, senior director of MIS and telecommunications at New York University Medical Center in New York. And the most important question, he says, is how many in IS are up to that challenge.

In the case of the embattled CIO and CTO mentioned earlier, the relationship between the two got so bad that even their departments were beginning to avoid each other. Instead of the two sharing in the victories of the new financial

system they were developing together, each stood back just as another opportunity for resentment.

"The financial organization was complaining they were working on systems and IS was getting the credit. They were getting the word out on what they were doing," Weiss says. IS, meanwhile, "would keep thinking they would reach closure on an item, and then finance would change the spec."

Eventually the chief executive officer stepped in to referee the bout. He brought in Weiss to clear the air — at the top — and introduce the two executives to Myers-Briggs. When they were done, they had developed a new understanding and respect for each other "and a new level of professional intimacy," Weiss says.

But getting intimate with someone who really isn't your type can be awkward at best. For many IS professionals, it just isn't them at all.

That picture must change quickly, Emmerich says. "In the future, employees will need to be emotionally literate. We're moving to a different type of organization, where people will work more as teams. [And they will be] built around functions."

## Different is good

To promote this new cooperation, Myers-Briggs administrators help employees focus on the advantages that different personality types can bring to a team or work environment. There are no rights or wrongs in the personality types, merely preferences.

"Myers-Briggs is a 16 room house," consultant Timothy Irwin, of Atlanta-based Irwin & Browning, says of the 16 personality types set forth by the method. "We all have our favorite room in the house — the place where we say 'I feel good here.'"

But, as in any house, communicating with someone else starts by knowing where you are and what room he's in. And in many ways, IS professionals are spending a lot of time in very different rooms than their users.

"There is a tremendous amount of disconnect with IS among other departments," Emmerich says. Users generally recognize IS staff as being intelligent. But they often think IS is clueless on how systems will actually be used. "Meanwhile, IS can have a hard time realizing they're looked at so poorly. The breakdown is with the user and misdirection."

Trust between IS and non-IS organizations is another casualty of poor communication.

Charles Savage, president of Knowledge Era Enterprises, Inc., a consultancy in Wellesley, Mass., says, "IS considers itself beleaguered and misunderstood — constantly under attack for not delivering. But what IS is feeling is not unlike what any staff function is feeling." The problem, Savage says, is the basic distrust all employees have of one another and their managers.

Overcoming distrust may be especially hard for IS professionals and managers, who historically rank very low on the Myers-Briggs, page 111

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## Myers-Briggs

CONTINUED FROM PAGE 108

ers-Briggs "feeling" scale. In other words, when IS professionals discuss how a task needs to be accomplished, they tend to be poor at verbalizing how the task affects the people involved. In fact, the greatest difference between IS and the general population is the percentage who take action based on what they think rather than what they feel. That doesn't help bring the IS staff closer to their customers.

The short shift IS professionals tend to give to feelings also doesn't help them learn to work in teams, which is a difficult process for any employee to learn, Myers-Briggs administrators agree.

"I've worked with many organizations to create teams," Weiss says, "and the most challenging have been the ones with the most technical people."

And then there are self-directed and cross-functional project teams. "This is where the bullets can really start flying," Alspach says. "In self-directed teams, IS really has to move into the feeling side of things because they have no intermediaries."

Alspach says her IS group began putting all IS employees through Myers-Briggs training three years ago when they began working in self-directed teams. All IS staffers in the group now work on teams, some on more than one team, and some on cross-functional teams with users.

"As they went through the training, it made them really aware of the different personality types. It was a rude awakening," Alspach says.

Carol Smallbeck, one of four team

coaches in the technical services group at Corning in Corning, N.Y., had the same experience when her IS group began implementing self-directed teams five years ago.

"It became a revelation," she says. "Team members suddenly started us-

"It was very enlightening," Check says. "What we found was that most of the [managers] in the group were built around the same [personality] type. But two managers were very different from the rest."

It shed light on why those two manage-

ment, Check says, the managers were energized and ready to work together and tackle team building.

But the energy didn't last.

"There wasn't any follow through," Check says. The original group of IS managers were the only members to take Myers-Briggs training, and they had only one introduction.

The result was that "we retained a lot of our own personal level," Check says. But "on the group level, the value was lost."

And that is one of the most common complaints about the use of Myers-Briggs in corporations. If employees don't follow up their new insights into different personalities, they forget what they've learned and fail to build on the knowledge.

"It requires some repetition to be successful," Irwin says. And if a project team is operating under a sense of urgency, then Myers-Briggs isn't the tool for them, he added.

William B. Computerworld's a associate editor. management. His internet address is [dw@cw.com](mailto:dw@cw.com).

## The 16 personality types set forth by the Myers-Briggs method "is a 16 room house. We all have our favorite room in the house, the place where we say, 'I feel good here.'"

— Tim Irwin, president, Irwin & Browning, Atlanta

discovering the dynamics behind other people that they otherwise might have thought were just different. They started listening to their options."

But sometimes it's IS managers who lack communication skills.

Check at NYU said he knows that problem firsthand. When his IS organization wanted to implement project teams in the application development group four years ago, it brought in a consultant to help. But after the consultant met with the top eight managers in the group, the task of team building took a backseat to the more immediate problem — getting the IS managers to work together well.

"The consultants said that one of the first things that had to happen was for the top two or three layers of management to better understand each other [because] there was a disconnect between managers and employees," Check says.

The solution: The managers were given their first introduction to Myers-Briggs.

ers had so often been at odds with the rest of the group and why there always seemed to be poor communication, Check says. Everyone agreed the problem had existed, but no one had understood why.

After completing the Myers-Briggs

### THE MYERS-BRIGGS METHODOLOGY

Developed by mother-daughter team Katherine Briggs and Isabel Myers, the Myers-Briggs Type Indicator breaks down personalities into 16 basic types according to how individuals prefer to process information. It is based on the theories of psychiatrist Carl J. Jung.

Myers-Briggs provides a measure of personality by looking at the various ways we prefer to receive information and perceive our surroundings. It describes preferences, not skills and abilities. It stresses that all preferences are equally important.

Myers-Briggs has been documented and researched with hundreds of studies, and the results of Myers-Briggs research is compiled at the not-for-profit research center started in 1975 by Myers and Mary McCauley, Center for Application of Psychological Types, 2615 K.W. 13th Street, Suite 403, San Jose, CA (800) 777-2278, fax (800) 723-6264, internet [capt@myers.org](mailto:capt@myers.org).

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**Interactive '95.** Anaheim, Calif., May 14-17 — Topics include: "Design Methodology and Resources," "The State of the Art of Multimedia Technology," "Research and Implementation Strategies." Contact: Jeff Justine, Medford, Mass. (800) 349-7246.

**Enterprise Product Data Management: The New Generation.** Boston, May 15-16 — Focus will be on how to access and satisfy your organization's product data management needs, and systems as your requirements change and the potential time and cost savings of data management. Contact: The Management Roundtable, Boston, Mass. (617) 232-6950.

**Micro Focus User 1995 Conference.** Philadel-

phia, May 15-18 — Contact: Micro Focus User Conference, Palo Alto, Calif. (415) 866-7356.

**Developing An Outsourcing Strategy: Success Factors for Information Technology and Business Sourcing.** Monterey, Calif., May 16-17 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 478-5888.

**Wireless Datacom Spring '95 Exposition and Conference.** San Jose, Calif., May 16-17 — The newly launched Mobility and Produc-

tivity Seminar will cater to business executives looking for more general information on wireless products and services. Contact: Communications Event, Inc., Norwalk, Conn. (203) 847-5131.

#### MAY 21-27

**Software Marketing Perspectives '95.** San Francisco, May 21-24 — Conference sessions will feature marketing case studies,

executive presentations, panel discussions, in-depth marketing workshops and interactive roundtable meetings. Speakers will include software company executives, industry analysts and marketing, advertising and public relations industry consultants. Fees: Early registration for *Software Marketing Journal* subscribers is \$795 and \$895 for non-subscribers. Contact: Software Marketing and Communications, San Francisco, Calif. (415) 296-7744.

**Society for Information Display's International Symposium, Seminar and Exhibition.** Orlando, May 21-26 — Focus will be on display technology requirements for public communications devices, systems and manufacturing. Keynote speakers: Lance Glasser of the Advanced Research Projects Agency (ARPA) will describe the current status of ARPA's display initiative; a speaker from Motorola, Inc. will outline the display requirements for public communications devices. Contact: Mark Goldfarb, Palmdale Institute for Research

Services, Arlington, Va. (800) 787-4777.

**SunWorld '95.** San Francisco, May 25-26 — Topics will include security on the Internet, the future of mobile, doing business on the Internet, industry trends in new technology and computing platforms of the future. Contact: Niche Hall Associates, Dedham, Mass. (800) 265-5035.

**Worldwide Customer Conference.** New Orleans, May 25-26 — Theme: "A Sterling Celebration... Strategies for Global Success." Customers from each of Sterling Software, Inc.'s business groups — Electronic Commerce, Applications Management, Systems Management, Federal Systems and International — will have the chance to explore current issues and exchange personal ideas with fellow customers. Contact: Sterling Software, Dallas, Texas (214) 691-6600.

#### MAY 28-JUNE 3

**1995 Business Re-engineering Conference.** New York, June 3 — Contact: The Conference Board, New York, N.Y. (212) 759-0000.

## Calendar

Re-engineering the Workplace

# New Found

By Linda Wilson



Bill West's Jeff Thompson: 'The jury is still out' on whether business objects can be successfully refined into an enterprise model

# datations

Time Warner, FedEx, Fidelity and other pioneers employ business objects to speed re-engineering and new development

**M**ohammed Fahim came to Time Warner Communications a year ago for a daunting assignment: Develop all the software applications for a start-up local telephone company that would provide service to 40 locations around the country.

Fahim knew that to accomplish this feat he would need an approach that would let him develop systems quickly and make continual changes to business processes.

His choice: business objects.

Business objects are building blocks representing business actors, events and processes such as customers, new store openings and order fulfillment. They are, in essence, cousins of technology objects such as windows or data structures.

"Business objects mirror the business instead of the computer system," explains Robert Shelton, president of Open Engineering, Inc., a San Francisco consultancy and chairman of the Business Object Management Special Interest Group (BOMSIG) in Framingham, Mass.

Formed as a part of the Object Management Group in December 1993, BOMSIG is a consortium of users and vendors working to develop common definitions and standards for business objects, Shelton says.

A small but growing number of companies, such as Fidelity Investment Co., US West, Inc., FedEx Corp., General Electric Co. and others, are em-

bracing the concept. They're using business objects to model processes and systems in re-engineering projects or to help analyze how their business works.

Because the concept is new and evolving rapidly, it's hard to gauge adoption. BOMSIG estimates that 40 to 100 organizations are currently developing business objects and libraries using a variety of approaches.

Business objects include the behaviors, procedures and attributes associated with the object. For example, a customer object includes attributes such as address, credit history and behaviors like placing an order or paying an invoice. Business object models include not only the objects themselves but the interactions between them.

Early adopters say business objects offer several benefits:

- Faster and cheaper delivery of new systems and simplified maintenance of older applications.
- Tighter links between software technology and business processes and functions.
- Better consistency and easier integration of applications due to their reusable nature.
- Good suitability to distributed environments.

Fahim says the ability to easily change how business is done is especially key in a new organization. Business processes are likely to evolve as the company grows and gains real-life experience, he notes, and computer systems must keep pace.

"I have seen too many systems that are just too brittle," says Fahim, director of information systems and services at the Denver-based cable television division of Time Warner, Inc. "I've seen sys-

New foundations, page 114



## New Foundations

CONTINUED FROM PAGE 113

tems that cannot be changed — period."

Business objects aren't without shortcomings, of course. Because they're so new, there's little shared experience to draw on.

Another problem is that business objects are difficult to design and require a significant investment in staff time. "I really think the jury is still out," says Jeff Thompson, director of service assurance system engineering at US West.

"Everyone wants it to happen," agrees Stephen D. Sprinkle, national managing director of Deloitte & Touche's information technology consulting unit. "We'll have to see how it plays out and how interchangeable [business objects] are."

### Moving forward

Pioneers such as Time Warner, which began its development efforts in May 1994, are plowing ahead.

Time Warner rolled out its first business object systems — order management and trouble management — in Rochester, N.Y., late last year and in New York City last month.

Systems will be extended to other cities as local telephone service is turned on, Fahn says. Other systems under development include service provisioning, network monitoring and billing.

His group plans to bring out dozens of systems during a three-year period. About 60 people, including 50 employees of CrescoSoft, Inc., a systems integrator in Englewood, Colo., are working full time to develop the systems.

The architecture for the new system comprises Sun Microsystems, Inc. SPARC 2000 servers running Unix and Sybase, Inc.'s System 10.2 relational database management system. The clients include SPARC 1900 workstations and Intel Corp. Pentium-based PCs.

To develop the objects, the group is using an object-oriented development tool called Visual Works from Pure Place Systems, Inc. in Sunnyvale, Calif.

### Fidelity decentralizes

Fidelity was attracted to business objects as a re-engineering tool. In 1991 the parcel carrier began a massive project to re-engineer its core air and ground operations. The goal was to prepare for a gradual move away from a centralized distribution system, explains Frank Ginnett, a senior technical fellow at Fidelity.

Under the old system, all packages were routed through Memphis. With the decentralized approach, packages travel through regional hubs. That meant moving from a centralized mainframe environment to a distributed object/server approach.

"You want to have more of your resources closer to the customer," Ginnett says.

The project involved several business processes, including aircraft scheduling,

aircraft maintenance, crew scheduling, weather tracking and volume prediction, courier scheduling, courier routing and planning and dispatch.

To re-engineer the systems, FedEx began with a traditional data model, which was converted to a business object model. From there, the company developed specific applications around so-called "process scenarios."

For example, each flight leg, such as Memphis to St. Louis, is a business object. A regional crew-scheduling system, then, includes only those flight legs occurring in that region. But those flight leg objects will also appear in other systems, such as aircraft maintenance.

So far, FedEx has installed the new Unix-based, distributed systems to numerous locations in Memphis. It also introduced several of the systems in regional hubs in Indianapolis, Dallas and Japan. Although there are no plans to do so, US is prepared to distribute systems to hubs in Newark, N.J.; Oakland, Calif.; Los Angeles, Dallas, and Riverside.

FedEx is also "nibbling at the edges" of decentralizing its package tracking operation, which involves the company's largest and most complex system, Ginnett says.

Business processes change during re-engineering, notes Tim Moldauer, a partner who heads Andersen Consulting's work with business objects. "So it is very important to make the business processes visible so that they can be changed."

## Three levels of objects



Indeed, US West was attracted by the fact that business objects can aid rapid application development.

The company's regulated phone service unit, Denver-based US West Communications, Inc., which operates in 14 states, has been working with business objects for nearly a year.

"It came out of hallway conferences," says Thompson, formerly director of information technology architecture.

"We were talking about finding out if there were opportunities for reuse. We started talking about business objects,

## Selected resources

**The Object Advantage: Business Processes Re-engineering with Object Technology.** Jon Anderson, ACM Press/Addison-Wesley Publishing, 1995, (212) 944-1318.

**Business Engineering with Object Technology.** David A. Taylor, John Wiley & Sons, 1995, (800) 225-5945.

**"Distributed Computing Monitor,"** Patricia Seybold Group, Boston, January 1995, (617) 742-5200.

**"Business Process Re-engineering with Objects,"** Data Management Review, Robert Shelton, December 1994.



**Business Process Re-engineering Ltd.** An Internet mailing list that covers a wide range of topics including business objects. To subscribe, send E-mail to list processor: [INFO.BPRL.UTS@SERVSW.TWU.TUDELFT.NL](mailto:INFO.BPRL.UTS@SERVSW.TWU.TUDELFT.NL).

**The Object Oriented Encyclopedia: Minding Corporate Information Systems Work.** Rob Atkinson with Michael J. Sport, Tao Books, 1994, (800) 822-8158.

**The Object Management Group Business Object Management Special Interest Group,** (800) 820-4300.

and it mushroomed from there," he says.

Six people worked full time to develop the enterprise model, beginning last June. The first version was released in October. US West is now refining the model and plans to begin developing applications based on those business objects.

"We should gain a commonality among our systems because everybody is looking at the company and its processes from a common point of view," Thompson says.

### Fidelity likes sharing

The opportunity to let applications share a common base based on business processes, as well as the idea of exchanging integration and maintenance, also appealed to Fidelity Investment in Boston.

"It's the reuse of [application] design and the reuse of understanding as distinct from the reuse of code," says John Gidman, vice president of investment technology at Fidelity's investment management division. "It is like institutional knowledge in a box."

Ironically, business objects evolved out of the early failures of object-oriented programming. Often, IS departments stockpiled libraries of supposedly reusable chunks of code without first thinking about how the business actually worked. Then, little thought was given to how the objects would actually be used.

"We use business objects primarily as an innovation to relate data structures and processes to real-world business actions," Gidman says.

So far, Fidelity has used business ob-

jects as the basis for two applications: a trading system, including the distribution of research and news announcements; and a compliance system, which involves adherence to Security and Exchange Commission regulations.

### Design, testing and cash

Be warned: This isn't a simple process.

"It's not easy to design an object that will be able to satisfy a number of different requirements within a company," explains John R. Rymer, editor of "Distributed Computing Monitor," a newsletter from the Patricia Seybold Group in Boston. "It takes very careful design and very careful testing."

And that costs lots of money, so IS shops must be willing to invest heavily in staff-front time to gain long-term savings.

For example, Andersen Consulting spent three years developing Project Eagle, a collection of business objects, tools and a methodology.

Similarly, the investment management division at Fidelity has been developing business objects for 3½ years.

Companies such as Fidelity are just scratching the surface of what is possible with business objects. Proponents of business objects envision a world in which generic objects, purchased commercially, fuel the continual change of objects and reuse it in with your order," Moldauer says. "I think that will require a lot more depth in terms of standards and common design approaches."

What is simplistic is the view that there is going to be an easy way to get some kind of open trade in business objects where I can take my customer object and snap it in with your order," Moldauer says. "I think that will require a lot more depth in terms of standards and common design approaches."

Wilson is a freelance writer in Glen Elder, Ill.



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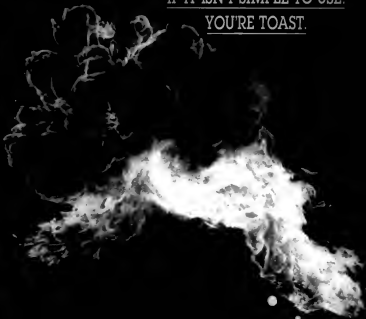
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## He's still not dead.

And believe it or not, cyberdelic godfather Timothy Leary wants the same things you do: friendly systems, digital immortality and a world where shiny, happy people are united through magnificent, mind-boggling technology—and maybe a little cybersex.



# Log in, Link up, Get off

By Joseph Maglitta

**T**imothy Leary is, unexpectedly, confessing, "I'm supposed to be this big drug guy, but I never made a dime selling drugs, and I can't roll a joint," he says, nimbly docking his jaggy, stubbly, 74-year-old bioshell at the cheap computer desk in his study. Outside, Beverly Hills spills jagged crags toward Los Angeles, which glows sooty orange-gold like a post-apocalyptic Oz. "And I'm supposed to be this big computer guy, but look

at my equipment. One of the principles of my life, which I violate when I have to, is that I never buy hardware or software. People just give me stuff."

The hands—wiry, witty, with diamond nails faintly gray with cigarette stains—click the mouse and

open a new reality. The scene, viewed on a Macintosh and NEC Technologies, Inc. Multisync monitor, looks strangely familiar. It's a house. His house. The one we're standing in. Except the cyberversion of this aging cliffside ranch glows lush, warmer, dreamier

than real life. It's gorgeous.

"This is Version 1 of my new digital home program," he explains. We "walk" through living room, study, bedroom. He clicks on a book in a bookshelf, and it opens. In 10 minutes or so we leave the CD-ROM package he is developing.

I have come to interview Leary about his new book *Chaos & Cyber Culture* (Bosun Publishing, Inc., Berkeley, Calif.). It is a seemingly odd, but inevitable, visit. Leary, after all, inhabits virtually the same world as do *Computerworld* readers: information, technology, chaos, supernetworks, distributed power. Yet his view is topiary, barely recognizable, as if glimpsed from the bottom of some psychedelic electronic ocean.

He is the original rebellious end

user, flipping a joyous mind to mainframe power freaks who would deny silicon power to free-minded *Neurotrans* host-bent on evolving into immortal light-sharping supervillains for the next millennia. I want to close the gap between our parallel worlds.

As I obey the handwritten sign on the front door and "Hello!" my way through the empty rooms and yard, I somehow expect a cross between Hugh Hefner, Mephistopheles and a maharishi—the sybaritic Acid King morphed into sensual cyberspace. Yet the thin, flannel-shirted legend who greets me on the patio seems little of the sort. He is more like an aged hipster under: still playful and professorial but undeniably worn by *Log In, Link up, Get off*, page 118

## In Depth: Interview with Timothy Leary

### Log in, Link up, Get off

CONTINUED FROM PAGE 117

years of admitted daily drug and alcohol use.

We sit side by side on a flat couch in his stark living room. Life-size portraits of John Wayne, Clint Eastwood and Albert Einstein lend suitable surrealism. At first, Leary occasionally peers, red-eyed into the distance, deeply inhaling from his cigarette. "What do you mean by 'spiritual'?" he asks intensely.

In such moments you glimpse the specter of the famous Harvard psychology professor fired in 1963 after his explosive adventures in psychedelics and sensory deprivation. Not that Leary is a has-been. He's a popular college lecturer and later this year will narrate a 10-part TV series called *New Breed*, airing in Japan. Soon he becomes more animated, occasionally punctuating a sentence by snapping his bony fingers. We sip microwave-reheated coffee brewed hours before.

**Joe Magitt:** As far back as 1950, as a researcher at the Kaiser Foundation, you criticized "the mainstream monopoly." You wrote: "I distrusted the mainstream because I saw them as devices that would only increase the dependence of individuals upon experts."

**Timothy Leary:** Everything I've been interested in throughout my 45 years of working has been — in empower individuals to be able to operate and program their own minds and brains. And more importantly, to meet with other people. If you're a top-down controller, you're not so much concerned about interaction.

The joke, of course, was the mainstream. What would the average person living in a home want with that?

**Magitt:** When did you first boot up?

**Leary:** It was in the early '60s. I had an Atari. Then I had an Apple. Then an IBM. They were all given to me.

**Magitt:** Who turned you on to PCs?

**Leary:** A funny little company, run by young people, of course, called Xerox. Had Harvard kids. They gave me a computer.

It was very interesting that the first generation of PC people — [Steve] Jobs and [Steve] Wozniak and [Bill] Gates himself — [included] hand-drawn communications, counterculture, '60s people who understood about the lesson of the '60s. The lesson, of course, is the power of individuals and communication.

**Magitt:** You began to write software...

**Leary:** My first published software program was called "Mud Mirror" [in 1980]. It was based on the work I had done at Berkeley and then at Harvard. I don't know how to code. I worked closely with a couple of brilliant, far-out, young — you didn't use the word hacker in those days — code cowboys.

**Magitt:** Do you still believe that spending much time on computers is turning you into an *amphibian*, a creature that lives in two worlds — the real world and cyberspace?

**Leary:** I don't see that anymore. I do a lot of word processing. I also modem out [to electronic mail and the Internet]. I've been fascinated by CD-ROM and the ability of all the graphics.

The breakthrough here is when the 10-year-old kid can download the 700 news onto CD and edit it and pop it back up and change it so you have Mickey Mouse's head on Bill Clinton's body. You can put the monstrosity on the Mona Lisa. That's a tremendous breakthrough.

My own obsession is to develop applications and methods that will empower individuals to do it themselves. The key for me is whether you can change the program. You can select the menu and go up,

you're doing anything with a computer that's not on-line, in a sense it's some sort of mental masturbation.

When you hook that phooze up to the computer, by definition [snaps finger] it's now an interpersonal communication device. And that leads of course to a World-Wide Web and Internet, which [media theorist Marshall] McLuhan was talking about when he said electricity is going to make the global village possible. And the world village is small, and everybody knows everybody else. It's just like Web sites.

**Magitt:** What about Lotus Notes-type systems? Are they interpersonal?

**Leary:** Once you hook up that modem [they are]. One of McLuhan's great phrases was that "the medium is the message." He's inviting us to change the word "medium." [MIT Media Lab Direc-

ties and he'd put them on the scale and pull his beard and watch them go up and down. Repetitious work should be done by machines. To force human beings to operate like machines, that's the assembly line legacy.

**Magitt:** You suggest that new technologies and countercultures such as hip-hop and cyberpunks and zippies are designed to find each other.

**Leary:** I've studied countercultures of the Gay '90s and the Roaring '20s and the Lost Generation. There are certain characteristics of Bohemians, Na, I believe that they were into communication. Media, media, media, media. The emphasis was on individual creativity. It's like the "new breed" in Japan today.

The first issue of any technology is machine fights with their wrenches opening up the hoods. They know all the jargon and cylinders and bytes and bits and all that. But it becomes humanized when counterculture people come in and particularly when women come in. I've always sought out and tried to be taught by the women in this movement.

I was part of a group, including several women, who were smuggling PCs into the Soviet Union before Gorbachev. We weren't actually smuggling we'd bring [computers] over and just leave them. We weren't hawking PCs on the Moscow High School grounds. It was just a natural thing to do: share this. It's all personal. It is interpersonal.

**Magitt:** Any advice for IBM and other giants of the computing world? Should their products be warmer, friendlier?

**Leary:** I totally honor and respect the hardware engineers. God bless 'em. I believe in the law of conservation. I know it's politically correct to put down consumers. But consumers are the ultimate democracy. Granted that consumers are manipulated by marketing, but at least they have a choice.

The hardware people and the money people understand that the more you can fulfill the desires and needs of people, the richer you're going to be. I honor that.

**Magitt:** You write that if a person writes straight, he should edit *stoned* or vice versa. Would you recommend that for computer programmers?

**Leary:** No! But... before you commit to the blueprint, you should probably get stoned and think. Once you [start to] code, you want it standard. When I hit the A-B-C, I don't want it to come out I-I-I-I.

**Magitt:** Many companies today want people to be more creative. Any advice?

**Leary:** I think the best way for awakening and exciting and encouraging your creativity is to hang with people who are more creative than you in different ways.

**Magitt:** Have you had any experience with electronic collaboration?

Log in, Link up, Get off, page 120

### Magitt's Picks

Reading Leary from on the Internet. Here's a sampling of pages by and about the man himself that were called "the most dangerous man alive."

<http://Publications.socsci.uci.edu/leary.html>  
<http://www.leary.com/leary/leary.htm>  
 Short pages for Timothy Leary and descriptions

<http://www.gutenberg.org/ebooks/leary.html>  
 Interactive software from On Digital magazine

<http://www.earthlink.net/~leary/leary.html>  
 Quotes by Leary No. 1 of TV's *Top Secret Count-Down* featuring Leary and comedian Judy Tzuka

<http://www.earthlink.net/~leary/leary.html>  
 Leary's history works, including *Psychology: An Autobiography*

<http://www.earthlink.net/~leary/leary.html>  
 Leary's words and other articles featuring works by Leary

<http://www.leary.com/leary/leary.html>  
 Random links to Learyworks

down, around. You can change it. Then it becomes interactive and interpersonal.

Now there are certain programs that I don't want to change, like word processing. I want A-B-C-D. But all of my software designs have involved people clumping the screen together. It's a team sport.

**Magitt:** Is software, does "interpersonal" mean "interactive"?

**Leary:** The word "interactive" — which has been one of my favorite words for 40 years — in a computer culture basically means reacting. It's a highly complicated program that reacts to you. Take a chess program that can beat a master. That's not interactive; that's highly reactive.

Interpersonal is when there's something or someone else on-screen who's moving with me. We're playing with each other, against each other. Whenever

ter Nicholas] Negroponte says the message is the message. I don't think Negroponte gets it.

See, in the tribe, the spoken word was the message. In the feudal world, [it's] the manuscript. Then the screen — that's the last 30 years. And now the modem is the message. Here that tattooed on your inner thigh or put that on your bumper sticker: "The modem is the message."

**Magitt:** When you get money out of an automated teller machine or buy oranges and watch the checkout clerk bar-code your package, do you feel technology has been degraded or filled short of its interpersonal potential?

**Leary:** I believe in efficiency. It spares human beings from slavery to the repetitions. In the old days, every grocer would be at the scales and you'd bring the ap-





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## In Depth: Interview with Timothy Leary

### Log in, Link up, Get off

CONTINUED FROM PAGE 116

**Leary:** The idea of jugging your body to the airport and putting it on a cylinder filled with bad air and flying 15 hours to go to Tokyo, and you get that 15-hour trip from the airport and you get into that elevator to talk to somebody, that is ridiculous. I've been on several videoconferencing programs [that are] great. [Whispers] That's the future....

**Magill:** Many people learned the hard way about the downside of drugs. Do you suppose there's an analogy in cyberspace—for example, a digital dependency or on-line overdose—that makes people neglect "the real world"?

**Leary:** Any way that any energy or technology can be misused, it's going to be. People are going to use it to deceive others, tap into others, addictively, masturbatorily spend hours looking at the screen instead of looking into the eyes of your loved one, yeah. People are going to be doing that all the time.

**Magill:** So what about introverted programmer types who get the latest Penthouse CD and grab the joystick instead of other human beings? Should we be worried about that?

**Leary:** No, it's good to play these different roles. It's all the brain, the brain, the brain, the brain.

We're talking about a new language based on light that is sent into the eyeballs and digitized and redigitized by the brain. For the first time in our history, kids can learn how to communicate with the language of the galaxy and the language of the brain—clusters of protons and chambers of light. It's an amazing thing. Brains love light. The 21st century is going to be the century of the brain [and] interbrain connections. And it's brains communicating using light. It's quite simple.

**Magill:** You've said that "immortality is digitizing. The more of yourself you digitize, the more of yourself is going to be immortal." What's that mean?

**Leary:** No reason why your great-grandchildren shouldn't be able to boot up your program and play a game of chess and interact with you even though you've been dead for a hundred years. If you want to immortalize, digitize.

**Magill:** How? You mention putting your personality into a database, direct brain/computer transfer, then viral existence in cyberspace. How far can someone go?

**Leary:** I don't like the virus metaphor anymore. I have over 500 cartoons I've collected over about 40 years of every piece of paper that has something to do with what I was doing. Eventually they'll be digitized. I have no great desire to have my words saved like Shakespeare's. But I

think that I'm in a unique position of being like a role model or an explorer for our species. I think it's my duty as a very intelligent, extremely well-trained, extremely eloquent humanist.

I have brackets here for two cryonics organizations to have my body and my brain frozen. Whenever I talk to a doctor now, we talk about voluntary desiccation, so you die



when they pull the plug. You have to orchestrate that.

I'm developing a "Quality of Life Scoreboard," an interactive computer game that lets you assess how satisfied you are with your life.

Everything I've done has been made possible by the waves of change. I just surfed the waves. There's one rule of thumb, looking back over the singu-

lar words that I've polluted the atmosphere with in my books and all that. My basic perspective is, oh, 50% of what I've said at any time is normal pundit wisdom. A quarter of what I've said is absolutely foolish, silly. But a quarter is really incredibly creative and avant garde. [Laughs.] I have to figure out which is which....

*Magill is Computerworld's senior editor, corporate strategies.*

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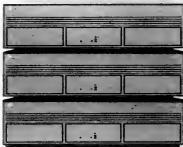
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# Stepping stones

**Cobol programmers augment current skills to ready themselves for new roles**

BY JOHN WEBSTER

**\* Rich Nienabutowski**

City systems engineer

City of Chicago Police Department

Cobol programmer for 17 years

At the beginning of the systems overhaul at the Chicago Police Department, orders from management were "pick up [the new technologies] or find another job," Rich Nienabutowski says.

The department's goal is to install Windows-based LANs in every district in run applications that access mainframe COBOL data. "I have a Cobol background, and I know C++," he says.

Part of the revamp includes developing an evidence system with Unisys Corp.'s Designer Workbench. His group is also testing Visual Basic from Foxpro, a subsidiary of Sybase, Inc., as a potential development tool, and Oracle Corp.'s relational database.

C++ presented the biggest challenge for Nienabutowski and his staff, however. "When we started going into C++, it [was] the hardest thing for Cobol programmers to learn." But, he says C++ is

similar to the assembler language, and Cobol procedures, such as checking the last character of a record, are absent in the object-oriented language.

To avoid shell shock, Nienabutowski eases his staff into the new technologies. For example, programmers develop sample applications to learn Oracle. "Then we include the sample into a larger program. We try not to jump people into bigger projects," he says.

**\* Valerie Rudolph**

Systems analyst

California Medical Review, Inc.

San Francisco

Cobol programmer for 12 years

When it comes to application development, faster is better, especially in the health care industry. Moreover, organizations such as California Medical are finding that off-the-shelf software can give them more speed — and then some.

"There was a shift in emphasis here. We looked at where we're going and what we can do faster and better," Valerie Rudolph says.

Because Rudolph's department needed to "develop very specific applications to run statistical data," it decided to install Microsoft Corp.'s FoxPro. "We went

with FoxPro because we could develop very rapidly" with it, she says.

FoxPro also required a new way of thinking. "Before, if you wanted to get a record, only one key would access it," Rudolph says. "With the relational database, there are a number of ways to get into it."

She has also been developing mini data-retrieval programs with Borland International, Inc.'s Paradox. "Now we're going into Visual Basic and trying to find the best balance between [that and FoxPro]. As a Cobol programmer, this is something you have to do."

**\* Joe Morris**

Programmer/analyst

U.S. Navy, Long Beach Naval Shipyard

Long Beach, Calif.

Cobol programmer for 10 years

As the naval base hones its Oracle® to replace a Honeywell Bull, Inc. IDS database, Joe Morris is polishing his database skills. "Mostly contractors are getting [the jobs now], but the government can't afford to keep them forever," he says.

To prepare developers to jump aboard the relational database bandwagon, government-sponsored training is available. Morris says he has a "fiddle around" with Asymetrix Corp.'s Info-Master relational database design tool.

The naval base does not use Info-

Modeler, but the database design process intrigues Morris. "I'm learning in-folders on my own, using more of a fall-on-your-face-and-pick-yourself-up method," he says. Morris hopes the Oracle training and self-taught database design will prepare him for the future.

**\* Brad Heine**

Project leader

John Hopkins Health System

Baltimore

Cobol programmer for 10 years

Physicians wanted broader access to patient information located on the mainframe, quicker editing capabilities and customizable user interfaces. To create a user-friendly graphical interface for the mainframe, Brad Heine and a team of four Cobol programmers developed a client/server application with Visual Basic.

"Visual Basic simplifies things," he says. Heine picked up some C, C++ and a little Visual Basic on his own and attended hospital-sponsored classes. "Most of us felt we were becoming dinosaurs. With Visual Basic, we're becoming marketable again," he says.

So far, Heine and his team have used Visual Basic to develop the mainframe back-end database as a server, while front-end interfaces and applications are due in June. "The task involves writing a data 'wrapper' or generic IO function, to allow the PC front-end application to communicate with the DB2 database," he says.

"It was difficult [to learn], but it's been fun and enjoyable learning something new."

Webster is a freelance writer in San Francisco.

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May 1, 1995 Section 2 of 2

# COMPUTERWORLD



## The Global 100

Outstanding  
Users of  
Information  
Technology  
From Around  
the World



Meet the *Computerworld* Global 100.

Tandem and its Partners are proud to sponsor this first in-depth, around-the-world look at the most innovative and efficient users of information technology, showcased by IDG *Computerworld* publications distributed in over 20 countries in 13 languages.

Increasingly, global commerce means that companies around the world face the same formidable set of business challenges. The enterprises profiled here are breaking new ground in the use of information technology to meet those challenges. In this publication you will see how they leverage technology to compete globally, improve service, cut costs, bring products to market faster, and use information in entirely new, thought-provoking ways.

And as impressive as these innovations are, more lie ahead. The experiences of the *Computerworld* Global 100 give us a window into the future of information technology, as well as showing us profiles of human ingenuity at its best.

On behalf of Tandem and its Partners, congratulations to the Global 100 winners, for being truly world-class 100.

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## Editor's Note

### Role models

IN THE PREMIER ISSUE OF THE GLOBAL 100, Computerworld presents 100 of the most outstanding information technology users in the world. From true global corporations to exceptional government agencies, these organizations are defining how global business will be conducted in the future.

Any IS manager struggling with the challenge of being — or becoming — a global player should consider the organizations and people featured in the following pages as worthy of emulation.

The Global 100 was a global effort in its own right. It will be translated into 13 languages and distributed in 22 countries. While editorial responsibility fell to the six person Special Projects Team (pictured below), we drew on resources from all four corners — sort of a virtual global project. We tapped 15 experts in more than 30 countries (see Nominating Committee, page 2), collected quantitative data from over 500 international companies, and coordinated reporting, writing and additional data gathering with a dozen Computerworld publications worldwide and with IDG News Service bureaus in Frankfurt, London, Paris, Brussels and Tokyo. Special thanks to all of these contributors.

If publications had been included on the Global 100 listing, we would have been a shoe-in.



Bruce Rayner

Editor, Computerworld Global 100





## Overview

Whatever the language or time zone.

**All Roads Lead to IT.** Our survey reveals many similarities in IT strategies among Global 100 nominees

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## GLOBAL TITANS

It takes a strong head and sturdy backbone to be a world class IT leader. Many are called, but few make the grade

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## Government Agencies

These **Public Sector Stars** look to information technology to increase efficiency and reduce costs

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Norsk Hydro's Svalin Bridge

## Emerging Markets

**Getting Wired Gets Weird** in Eastern Europe and Russia as IS managers struggle to set up shop

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Shanghai No. 2 Machine Tool Works' Lou Xin

## Emerging Markets

**The Giant Stars** in China as free enterprise takes hold. IS is proving to be an El Dorado for India.

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Scania & Bengt's Strömberg in Sweden

## Faces

Up close and personal with some of the **Global 100's** IS managers.

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### Naming

Many thanks to all who nominated organizations to the Global 100 list.

**Norbert Althaus**  
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Germany

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Argentina

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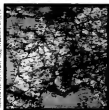
**J. P. Mortimer**  
EBC  
Brazil



## Japan

Japan's Global 100 companies achieve  
**Harmonic Convergence**  
by matching technology with the  
way people work

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## Western Europe

National regulations make  
**Border Crossings** difficult and  
complicate the building of a  
Pan-European infrastructure

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## Southern Hemisphere

Global 100 companies south of the  
equator emerge. **Out of the Shadows**  
of their Northern neighbors.

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The Global 100

Industry	Company	Country	Revenue	Assets	Employees	Market Capitalization	Global 100 Ranking
Automotive	Toyota Motor	Japan	1,000,000	1,000,000	1,000,000	1,000,000	1
Chemical	Shell	Netherlands	1,000,000	1,000,000	1,000,000	1,000,000	2
Food	Unilever	Netherlands	1,000,000	1,000,000	1,000,000	1,000,000	3
Healthcare	Pfizer	USA	1,000,000	1,000,000	1,000,000	1,000,000	4
Technology	IBM	USA	1,000,000	1,000,000	1,000,000	1,000,000	5
Telecommunications	AT&T	USA	1,000,000	1,000,000	1,000,000	1,000,000	6
Energy	Exxon	USA	1,000,000	1,000,000	1,000,000	1,000,000	7
Financial	JP Morgan Chase	USA	1,000,000	1,000,000	1,000,000	1,000,000	8
Transportation	Boeing	USA	1,000,000	1,000,000	1,000,000	1,000,000	9
Media	Time Warner	USA	1,000,000	1,000,000	1,000,000	1,000,000	10
Pharmaceuticals	Bristol-Myers Squibb	USA	1,000,000	1,000,000	1,000,000	1,000,000	11
Automotive	Ford	USA	1,000,000	1,000,000	1,000,000	1,000,000	12
Chemical	Dow Chemical	USA	1,000,000	1,000,000	1,000,000	1,000,000	13
Food	General Mills	USA	1,000,000	1,000,000	1,000,000	1,000,000	14
Healthcare	Amgen	USA	1,000,000	1,000,000	1,000,000	1,000,000	15
Technology	Microsoft	USA	1,000,000	1,000,000	1,000,000	1,000,000	16
Telecommunications	Verizon	USA	1,000,000	1,000,000	1,000,000	1,000,000	17
Energy	BP	UK	1,000,000	1,000,000	1,000,000	1,000,000	18
Financial	Bank of America	USA	1,000,000	1,000,000	1,000,000	1,000,000	19
Transportation	Airbus	France	1,000,000	1,000,000	1,000,000	1,000,000	20
Media	News Corp.	USA	1,000,000	1,000,000	1,000,000	1,000,000	21
Pharmaceuticals	Novartis	Switzerland	1,000,000	1,000,000	1,000,000	1,000,000	22
Automotive	Volkswagen	Germany	1,000,000	1,000,000	1,000,000	1,000,000	23
Chemical	BASF	Germany	1,000,000	1,000,000	1,000,000	1,000,000	24
Food	Nestle	Switzerland	1,000,000	1,000,000	1,000,000	1,000,000	25
Healthcare	Roche	Switzerland	1,000,000	1,000,000	1,000,000	1,000,000	26
Technology	SAP	Germany	1,000,000	1,000,000	1,000,000	1,000,000	27
Telecommunications	Telecom France	France	1,000,000	1,000,000	1,000,000	1,000,000	28
Energy	EDF	France	1,000,000	1,000,000	1,000,000	1,000,000	29
Financial	BNP Paribas	France	1,000,000	1,000,000	1,000,000	1,000,000	30
Transportation	Alstom	France	1,000,000	1,000,000	1,000,000	1,000,000	31
Media	France Presse	France	1,000,000	1,000,000	1,000,000	1,000,000	32
Pharmaceuticals	Sanofi-Sintabo	France	1,000,000	1,000,000	1,000,000	1,000,000	33
Automotive	Renault	France	1,000,000	1,000,000	1,000,000	1,000,000	34
Chemical	Elf	France	1,000,000	1,000,000	1,000,000	1,000,000	35
Food	Carrefour	France	1,000,000	1,000,000	1,000,000	1,000,000	36
Healthcare	Novartis	Switzerland	1,000,000	1,000,000	1,000,000	1,000,000	37
Technology	Siemens	Germany	1,000,000	1,000,000	1,000,000	1,000,000	38
Telecommunications	Deutsche Telekom	Germany	1,000,000	1,000,000	1,000,000	1,000,000	39
Energy	E.ON	Germany	1,000,000	1,000,000	1,000,000	1,000,000	40
Financial	Commerzbank	Germany	1,000,000	1,000,000	1,000,000	1,000,000	41
Transportation	Deutsche Bahn	Germany	1,000,000	1,000,000	1,000,000	1,000,000	42
Media	RTL	Germany	1,000,000	1,000,000	1,000,000	1,000,000	43
Pharmaceuticals	Merck	Germany	1,000,000	1,000,000	1,000,000	1,000,000	44
Automotive	Porsche	Germany	1,000,000	1,000,000	1,000,000	1,000,000	45
Chemical	Wacker	Germany	1,000,000	1,000,000	1,000,000	1,000,000	46
Food	Beck's	Germany	1,000,000	1,000,000	1,000,000	1,000,000	47
Healthcare	Boehringer Ingelheim	Germany	1,000,000	1,000,000	1,000,000	1,000,000	48
Technology	Infineon	Germany	1,000,000	1,000,000	1,000,000	1,000,000	49
Telecommunications	Telecom Italia	Italy	1,000,000	1,000,000	1,000,000	1,000,000	50
Energy	Enel	Italy	1,000,000	1,000,000	1,000,000	1,000,000	51
Financial	UniCredit	Italy	1,000,000	1,000,000	1,000,000	1,000,000	52
Transportation	Alitalia	Italy	1,000,000	1,000,000	1,000,000	1,000,000	53
Media	Mediaset	Italy	1,000,000	1,000,000	1,000,000	1,000,000	54
Pharmaceuticals	Novartis	Switzerland	1,000,000	1,000,000	1,000,000	1,000,000	55
Automotive	Fiat	Italy	1,000,000	1,000,000	1,000,000	1,000,000	56
Chemical	Montedison	Italy	1,000,000	1,000,000	1,000,000	1,000,000	57
Food	Barilla	Italy	1,000,000	1,000,000	1,000,000	1,000,000	58
Healthcare	Novartis	Switzerland	1,000,000	1,000,000	1,000,000	1,000,000	59
Technology	STMicroelectronics	Italy	1,000,000	1,000,000	1,000,000	1,000,000	60
Telecommunications	Telecom Italia	Italy	1,000,000	1,000,000	1,000,000	1,000,000	61
Energy	Enel	Italy	1,000,000	1,000,000	1,000,000	1,000,000	62
Financial	UniCredit	Italy	1,000,000	1,000,000	1,000,000	1,000,000	63
Transportation	Alitalia	Italy	1,000,000	1,000,000	1,000,000	1,000,000	64
Media	Mediaset	Italy	1,000,000	1,000,000	1,000,000	1,000,000	65
Pharmaceuticals	Novartis	Switzerland	1,000,000	1,000,000	1,000,000	1,000,000	66
Automotive	Fiat	Italy	1,000,000	1,000,000	1,000,000	1,000,000	67
Chemical	Montedison	Italy	1,000,000	1,000,000	1,000,000	1,000,000	68
Food	Barilla	Italy	1,000,000	1,000,000	1,000,000	1,000,000	69
Healthcare	Novartis	Switzerland	1,000,000	1,000,000	1,000,000	1,000,000	70
Technology	STMicroelectronics	Italy	1,000,000	1,000,000	1,000,000	1,000,000	71
Telecommunications	Telecom Italia	Italy	1,000,000	1,000,000	1,000,000	1,000,000	72
Energy	Enel	Italy	1,000,000	1,000,000	1,000,000	1,000,000	73
Financial	UniCredit	Italy	1,000,000	1,000,000	1,000,000	1,000,000	74
Transportation	Alitalia	Italy	1,000,000	1,000,000	1,000,000	1,000,000	75
Media	Mediaset	Italy	1,000,000	1,000,000	1,000,000	1,000,000	76
Pharmaceuticals	Novartis	Switzerland	1,000,000	1,000,000	1,000,000	1,000,000	77
Automotive	Fiat	Italy	1,000,000	1,000,000	1,000,000	1,000,000	78
Chemical	Montedison	Italy	1,000,000	1,000,000	1,000,000	1,000,000	79
Food	Barilla	Italy	1,000,000	1,000,000	1,000,000	1,000,000	80
Healthcare	Novartis	Switzerland	1,000,000	1,000,000	1,000,000	1,000,000	81
Technology	STMicroelectronics	Italy	1,000,000	1,000,000	1,000,000	1,000,000	82
Telecommunications	Telecom Italia	Italy	1,000,000	1,000,000	1,000,000	1,000,000	83
Energy	Enel	Italy	1,000,000	1,000,000	1,000,000	1,000,000	84
Financial	UniCredit	Italy	1,000,000	1,000,000	1,000,000	1,000,000	85
Transportation	Alitalia	Italy	1,000,000	1,000,000	1,000,000	1,000,000	86
Media	Mediaset	Italy	1,000,000	1,000,000	1,000,000	1,000,000	87
Pharmaceuticals	Novartis	Switzerland	1,000,000	1,000,000	1,000,000	1,000,000	88
Automotive	Fiat	Italy	1,000,000	1,000,000	1,000,000	1,000,000	89
Chemical	Montedison	Italy	1,000,000	1,000,000	1,000,000	1,000,000	90
Food	Barilla	Italy	1,000,000	1,000,000	1,000,000	1,000,000	91
Healthcare	Novartis	Switzerland	1,000,000	1,000,000	1,000,000	1,000,000	92
Technology	STMicroelectronics	Italy	1,000,000	1,000,000	1,000,000	1,000,000	93
Telecommunications	Telecom Italia	Italy	1,000,000	1,000,000	1,000,000	1,000,000	94
Energy	Enel	Italy	1,000,000	1,000,000	1,000,000	1,000,000	95
Financial	UniCredit	Italy	1,000,000	1,000,000	1,000,000	1,000,000	96
Transportation	Alitalia	Italy	1,000,000	1,000,000	1,000,000	1,000,000	97
Media	Mediaset	Italy	1,000,000	1,000,000	1,000,000	1,000,000	98
Pharmaceuticals	Novartis	Switzerland	1,000,000	1,000,000	1,000,000	1,000,000	99
Automotive	Fiat	Italy	1,000,000	1,000,000	1,000,000	1,000,000	100



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# All roads

## The Global 100

Outstanding Users of Information Technology From Around the World

### Argentina

Sud Argentina SA

### Australia

Australia and New Zealand Banking Group  
The British 100 Proprietary Co. Ltd.  
China Paper Ltd.  
Qantas Airways Ltd.  
Telstra Australia

### Belgium

ATA Concert NV

### Brazil

Banco Bradesco SA  
Petrobras Brasileira SA-PETROBRAS  
WAGB Brasileira Brasileira SA  
Vale do Rio Doce, Companhia

### Canada

Metropolitan Toronto Police  
Toronto Stock Exchange  
TransCanada Pipeline Ltd.

### Chile

COMBLES Chile-Sidrales Chiqueros

### Czech Republic

Stato Automobili AS

### Egypt

Information and Facilities Support Center

### France

Aerospaciale  
Aerotech  
CIP Automobile SA

### Group Portals

### Germany

BMW  
Deutsche Bank AG  
Deutsche Bundespost Telekom  
Deutsche Lufttransport AG

### Hong Kong

The Royal Hong Kong Jockey Club

### India

Madhavan Laxmi Ltd.  
National Information Centre  
Info Engineering & Locomotive Co. Ltd.  
The Info Press & Steel Co. Ltd.

### Indonesia

Bank.com

### Italy

Banco Andromeda Veneto S.p.A.  
ENEL S.p.A.  
Fiat S.p.A.  
Indesit S.p.A.

### Japan

The Dai-ichi Kangyo Bank Ltd.  
Japan Finance Corporation for Small Business  
Jensen Co. Ltd.  
Kao Corp.  
Shimizu Corp.  
M&T Ltd.  
Nippon Telegraph and Telephone Corp.  
The Nomura Securities Co. Ltd.  
Pulse Ltd.  
Seven Stars Japan Co. Ltd.

### South Korea

Hyundai Electric Power Co., Inc.  
Hyundai Motor Corp.

### Mexico

Carson SA

### The Netherlands

Royal Dutch PTT Telecom B.V.

### New Zealand

Fisher and Paykel Ltd.  
New Zealand Inland Revenue Department

### Norway

Reinert Engineering AS

### Saudi Arabia

Arab National Bank

### Singapore

National Computer Board  
Singapore Network Services

### South Africa

First National Bank Holdings Ltd.

### South Korea

Hyundai Corp.  
The Samsung Bank Ltd.  
Pohang Iron and Steel Co. Ltd.  
Samsung Electronics Co. Ltd.

### Spain

Banco Exterior de España

# lead to



#### Sweden

Saab-Scania AB  
Scandinavian Airline System  
Volvo AB

#### Switzerland

ABB Swiss Brown Boveri Ltd.  
Schweizer Schienenverkehrs Gesellschaft

#### Turkey

Aerolu AB

#### UK

Barclays Bank PLC  
Bass PLC  
British Petroleum Co. PLC  
Crest Holdings PLC  
Hulk Lines PLC (Aeromarine Group)

#### USA

AMP Corp.  
CSC Corp.  
The Charles Schwab Corp.  
The Chase Manhattan Corp.  
Chicago Mercantile Exchange  
The Coca-Cola Co.  
Citi Life and Cos.  
Fidelity Investments  
Ford Motor Co.  
ITT Hartford  
MCI Communications Corp.  
Merrill Lynch & Co., Inc.  
Morgan Department of Social Services  
Nike, Inc.  
PepsiCo Energy Co.  
Phillips Petroleum Co.  
Ryder System, Inc.  
United Health Care Corp.  
United Parcel Service, Inc.  
Wal-Mart Stores, Inc.  
Washington State Department of Information Services  
Wells Fargo & Co.  
Weyerhaeuser Co.  
Xerox Corp.

#### Ukraine

Pravobank, Commercial Bank

United Arab Emirates  
Emirates Airline

come from the most developed regions in the Northern Hemisphere: 28 from North America, 27 from Western Europe and 13 from Japan. But there is also fair representation from the rest of the world: Argentina, Australia, Chile, India, South Korea, New Zealand and the Ukraine.

Whatever the language or time zone, these companies share an innovative approach to information technology strategy.

Take, for example, Emirates Airlines, one of the fastest growing airlines in the world. In fiscal 1994, the United Arab Emirates-based carrier spent \$36 million as part of its move to a client-server information architecture. While not without transition al headaches, the setup has Sun Microsystems, Inc. servers managing Emirates' corporatewide, mission-critical business applications, including airport ground services, accounting and passenger revenue, cargo, payroll and personnel.

"The ability to deploy both applications and systems more efficiently and more rapidly gives Emirates a strategic advantage," says Hugh Price, senior general manager of information technology.

**Strategic advantage.** The mantra is repeated by many Global 100 companies. In many cases, advantage is being achieved through re-engineering, downsizing and conversion from legacy to distributed systems.

Twenty-one organizations were nominated for their client/server systems, 20 for their networks and 12 for business process re-engineering efforts.

These trends are picked up in Computerworld's survey of the Global 100 nominees. The Top 10 factors identified by respondents as necessary for global

information technology leadership were creating closer ties between business and IT, improving customer service, and understanding and using new technologies.

Other factors survey respondents mentioned include spending more on training and development for both IT professionals and technology end users, keeping a

*Continued on page 8*

IT MIGHT BE MONEY that makes the world go round, but information technology keeps the orb on its axis. Whether for inventory control or intercontinental product design, the best organizations know how to harness information technology for competitive advantage.

The 100 companies listed in this issue are case studies in using information technology as a competitive weapon. Culled from more than 500 nominations submitted by information technology vendors, consultants and Computerworld editors in more than 40 countries, the Global 100 brings together some of the most outstanding users of information technology in the world.

Who are the Global 100? They come from all industries and all corners of the world. Most are international companies, and some are true global players with highly integrated worldwide operations, such as Ford Motor Co. (see "Global Titans," page 11). Several are government agencies (see "Public Sector Stars," page 22).

Eighty-five percent of the Global 100



Continued from page 7

tight rein on costs, strengthening vendor and customer partnerships, and imitating business process re-engineering. One company identified "risk-taking" as its key to leadership.

Many of the Global 100 companies combine these factors in their strategic plans. For instance, Codelco Chile, the world's largest copper producer, recently went through a massive re-engineering project, outsourcing much of its information systems in an attempt to slash production costs. So far, Codelco says, it has managed to cut the cost of a pound of copper from 68 cents to 62 cents and expects to reach the world class cost of 50 cents per pound.

As part of its downsizing and re-engineering initiative, The Kwangju Bank Ltd in South Korea spent nearly \$8.6 million on information systems last year. The bank transitioned from a mainframe environment to a distributed client/server architecture and revamped its on-line transaction processing system, says Ahn Tae Joo, Kwangju's general manager.

Compared with many of its peers on the Global 100 list, however, Kwangju's information technology investment is nothing special. With its investment averaging out to \$4,500 for each of its 1864 employees, Kwangju is only a middling information technology spender.

Of course, information technology spending can fluctuate dramatically from year to year. Budgets also depend on a company's health, the level of direct competition and the sophistication of the market. Five of Kwangju's competitors in the banking sector, comprising 23 companies—more than any other industry segment on the Global 100 list—spent more than \$30,000 per employee in either 1993 or 1994. Three of those big spenders are European, and two are in the U.S.: Ukraine's Privatbank, Commercial Bank, however, spent less than \$1,000 per employee in fiscal year 1994.

As expected, it is the technology sensitive vertical market—primarily in the developed world—that reports the highest per employee information technology spending. Financial services reported an average spending of \$27,442 per employee, the insurance sector averaged \$29,815 per employee, and telecommunications weighed in at \$10,170 per employee.

However, one of the Global 100's untested leaders in information technology spending per employee comes from Japanese consumer goods.

Tokyo-based Kan Corp., maker of floppy disks, consumer products and specialty chemicals, reports spending \$27,000 per employee last year on building a global information technology empire. Kan, like leading edge U.S. rival Procter & Gamble Co., is investing in information technology to gather more detailed information on its customers and to meet the demands of quick response production and logistics (see "Harmonious Convergence," page 36).

How do these companies know they are getting their money's worth from information technology? According to the Global 100 survey, about half of all respondents measure the performance of information technology by asking their internal and external customers

for feedback. Only about a quarter of the respondents say they use traditional return on investment (ROI) or cost/benefit calculations to justify information technology.

Bass PLC, a British food and beverage distributor, gets its feedback through in-house "customer care" surveys, according to Brian Wilson, information technology director. Likewise, Phillips Petroleum uses customer satisfaction and management perception of value added as two of its primary performance measures.

On the other hand, CSX Corp., a Richmond, Va.-based \$9.5 billion transportation company, sticks with a more traditional quantitative approach. According to Joe Vasconcellos, manager of transportation system development, CSX insists on seeing an ROI on every project based on a three-year ROI.

CSX is among the majority of Global 100 companies that give their chief information officers virtually total control over international IT investment decisions. And the hot spot for investment this year is Western Europe. About half of those surveyed plan to increase their IT spending in Western Europe. The UK (17%) and Germany (12%) are mentioned most frequently as targets for increased IT spending.

BY WRITTEN BY BRUCE REYNOLDS, COMPUTERWORLD USA

For company and industry rankings, please consult the white book at:

DATA GROUP SOURCEBOOK AND COMPANY RANKINGS SOURCEBOOK



## The Global 100



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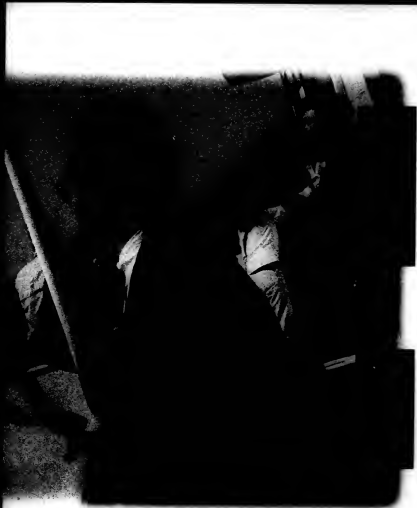
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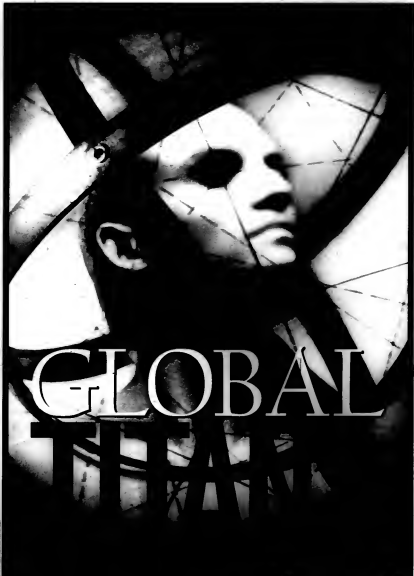
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# GLOBAL THREAT

Photo: Christopher Brown/Art

## Global Titans

**G**LOBALIZATION MIGHT BE RAPIDLY SHRINKING THE WORLD, but not for technologists. In fact, Peter Gerard, executive vice president at Deutsche Bank AG, says the opposite is true. "If time and place equal zero, 'globally' doesn't exist anymore," he says. "Users are present anywhere, anytime by means of a global electronic network. This emphasizes the importance of transaction processing and real-time information access."

And make no mistake: That kind of instantaneous, universal, *By Joseph Maglitta* postglobal service demands more technical supercharging than simply hanging a few more terminals off the old headquarters mainframe. It's one thing to run an international business with data centers in a couple dozen countries. It's quite another thing to automatically flash

thousands of financial results to traders on five continents. Or to let a design engineer in Turin, Italy, interactively collaborate on line with colleagues in São Paulo, Detroit and Cologne.

No surprise, then, that leading global players, including ABB Asea Brown Boveri Ltd., Barclays Bank PLC, Nike, Inc., The Chase Manhattan Corp., Deutsche Bank AG, Ford Motor Co., Glaxo Holdings PLC, Kao Corp., NSK Ltd., Phillips Petroleum Co. and Toyota Motor Corp., are scrambling to invest millions in new infrastructures, networks, computer systems and updated personnel. Companies are betting that the massive, unprecedented tech

**A strong head.** Remember that stereotype about technology shy chief executive officers? The ones who leave information technology to "our technical people"? Forget it. One striking characteristic that truly global companies have in common is their leaders' zeal for information technology.

Take Andrew Buxton, group chairman at Barclays. Three years ago, Buxton felt that his senior staff wasn't paying enough attention to the latest technical advances, so he personally organized seminars for 60 top executives.

Today, the UK's largest bank brims with technology. A new sys-

# It takes sharp eyes, a strong head and a sturdy backbone to be a world-class IT leader.

nology buildup will help them dominate new, borderless markets the way they dominated home markets in earlier eras.

"You can no longer run independently in the U.S. vs. the UK vs. Norway vs. China," says John Mithm, senior vice president of corporate technology at Phillips Petroleum, a \$12 billion oil company based in Bartlesville, Okla., with operations in 17 countries. "We need to know what's happening in the other places."

Many companies are willing to invest awesome sums for the edge each information may provide. Deutsche Bank, for example, plans to spend \$975 million on information technology this year.

Of course, the most global of the Global 100 companies don't just throw money at technology. Tough-minded shareholders see to that. But exactly what are these global pacesetters doing?

For starters, the information technology basics that consume many lesser rivals, including quality, re-engineering, cost control, efficiency and use of new technologies, are considered foundations, not destinations. Some of the world's best technology users share a surprising number of other features.

tem called Fraud 2000 is credited with spotting 14 frauds a day. Lending Adviser, an intelligent knowledge-based system, serves bank branches worldwide. Buxton himself chairs Barclays' new information technology board. Such bold commitment recently earned him recognition from the London Business School.

Many of Buxton's peers share his ebullience for information technology. Countryman Sir Richard Sykes, Glaxo chairman, waxes enthusiastic about how technology can speed drug manufacturing, generate faster returns on investment and catalyze corporate re-engineering and change. At Swiss engineering giant ABB, CEO Percy Barnevik says any company that doesn't consider itself an information technology company is doomed. Some executives, including Phillips' new chairman, Wayne Allen, have even done tours of duty in information systems departments.

Another striking similarity: These giants don't go nuts trying to figure the exact payoff from every dollar, pound, yen or mark spent on technology. While all require cost justification, financial

Continued on page 16

# United Parcel Service

**With a 10-year, \$3 billion technology plan, UPS hopes to strengthen electronic links with its 12 million customers**

**T**ECHNOLOGY LEADERS are made, not born. Just ask Frank Erbrick. In 1985, board members at Atlanta-based UPS concluded that the shipping company was lagging behind archrivals Federal Express Corp. and Roadway Services, Inc. in information technology.

Executives split. Some argued that "Big Brown" needed to pull itself into the technological age. Others noted UPS already had the best on-time record in the industry. And the new UPS CEO? "I was dragged in kicking and screaming," laughs Erbrick, a 33-year UPS veteran.

The rest is industry history. Led by Chairman Kent "Ode" Nelson, the world's largest package delivery service launched a five-year, \$2 billion technology plan. The buildup was awesome. In 1985, UPS's information systems group comprised a mere 118 people and spent \$40 million. Today's IS staff totals 4,000.

Erbrick became a technology champion. His teams cranked dramatic fixes. In 1991, UPS created the first nationwide mobile data service, which linked 70 commercial carriers. A \$180 million program placed handheld data collection computers in 53,000 vehicles. Last year, UPS became the first package deliverer to let customers use CompuServe and Prodigy to order services.

Has the investment paid off? Since 1985, UPS's annual sales have surged from \$7.6 billion to \$19.4 billion. Annual income climbed to \$900 million, from \$568 million. Technology also let UPS go global. It now delivers 3 billion packages a year to 200 countries and territories and employs 303,000.

It's difficult to say how much growth resulted from information technology. But there's no turning back. UPS budgeted another \$1 billion for information technology between 1992 and 1997. And, Erbrick says, "we're going to exceed that."

Topping the new priority list is a new global customer automation system and worldwide deployment of the on-truck computers.

Next month, a revamped version of its Maxo-Ship package tracking system will reach 25,000 large customers, UPS says.

It will invest \$300 million annually for the next few years on customer automation. By late 1996, Erbrick says, UPS will be able to provide real-time electronic data on each of the 12 million packages it will ship daily. UPS also hopes to create stronger electronic links with its 12 million customers.

At a glance	
UPS delivers 3 billion packages a year to 200 countries and territories	
Annual IS spending	\$200 million
IS spending per employee	\$635
Annual IS spending as % of revenue	1.02%
Number of IS employees	4,000

Source: Computerworld editorial and company reports for fiscal year 1992

and inventory management business. But the once-hesitant Erbrick remains undaunted. "Nobody in the industry will be able to touch us by the year 2000."

BY JENNIFER M. MALLON, A COMPUTERWORLD USA SENIOR EDITOR



Technology champion Frank Erbrick steered an information technology buildup that has helped annual earnings at United Parcel Service nearly double.

## Global Titans

Continued from page 34

considerations are being balanced with nontraditional measures such as customer satisfaction. In general, the trend is to assess technology as part of a project, not by itself.

Finally, strong horses must have strong stomachs. Even in hard times, they can't be afraid to invest in information technology. In 1992, when Barclays suffered the first loss in its 300-year history, Buxton refused to slash information technology outlays or to lay off any of the bank's 7,000-person IS staff. He also locked the London-based firm's technology budget at about \$1.4 billion.

Similarly, three years after New York-based Chase lost \$334 million, turnaround chairman Thomas G. LaBrecque approved a technology budget exceeding \$500 million—more than half the bank's annual earnings.

"Half the battle is winning people's confidence," says Chase Chief Information Officer Craig D. Goldman. "You have to paint a vivid description of what life could be like in the information age."

**A firm handshake.** The best global firms also cast executive support and business-technology links in organizational concrete. Thanks to systematic systems planning, distinctions between IS goals and business goals are fewer than they might otherwise be.

One big reason: Every technology boss in this group of companies reports to a chairman, president or other top executive rather than to a financial chief. CIOs routinely attend strategic planning meetings. Most of these global leaders employ a mixed, matrix

Another factor also boosts alignment: Increasingly, technology heads aren't technologists. Every CIO interviewed came from a general business background, many have MBAs. Ford's new CIO is its former research director. NSK's top IS manager spent half his career outside IS. While such links don't give information technology leaders carte blanche, they certainly bring technology into the inner circle.

**Sharp eyes.** If technology leaders had a maxim, it might be "Think globally; act everywhere." Unlike international firms, which run scattered but unconnected or minimally linked operations, global firms view the world as a single, linked resource.

Kao, a consumer products manufacturer known for its floppy disks, and automotive components maker NSK have developed integrated systems that link sales, production scheduling, manufacturing and logistics. Both Tokyo-based firms are fully integrating their worldwide operations into these systems.

Challengers, NSK's new global system, will enable NSK to sell products on a global rather than regional basis. "The goal of our globalization efforts is to supply our customers at the most appropriate point, wherever in the world that is," says Masao Murata, general manager of NSK's IS department.

Few have looked harder or wider at linking global resources than Ford. On Jan. 1, the \$406 billion Dearborn, Mich., automaker completed a massive global reorganization, called Ford 2000. One major goal is a \$6 billion international program to build "world

# Networks are the trade routes of the global village.

structure that combines centralized information technology guidance and services with decentralized technologies. At Barclays, Ford and elsewhere, a dozen or so top executives and technologists, including the CEO, sit on a high-level technology policy board. (One CIO describes this role as the corporation's "technology conscience.") A second board comprising business unit heads or divisional CIOs is also common.

In the field, companies disperse IS workers and much of the control into business units. A good example is Nike. In April, the Beaverton, Ore., maker of athletic shoes and clothing introduced a new global IS structure throughout 30 countries.

Like many other corporations, Nike had "six or eight major global information technology organizations," says Bob Kretzberg, vice president of operations. That led to expensive, duplicated effort and chaos. So after a year of planning, executives decided to reassign most of Nike's 750 technologists into front-line business units. A 200-member group at headquarters handles network platforms, operational standards, education and consulting for the \$3.9 billion firm. A regional technology manager serves each continent.

Kretzberg says it's too early to judge success. One concern: "How do you manage without it becoming an exploding state?" Nonetheless, he says he is convinced the approach is sound.

care" on three continents. To that end, five vehicle program centers were established in Germany, England and the U.S.

Moreover, Ford created six new international design centers in Europe, Asia and North America. Those studios are linked to the company's new \$84 million advanced engineering center in Dearborn via T1 lines, satellites and LANs. Engineers and designers will be able to do collaborative crash and flow analysis, simulations and other electronic work from networked workstations. Company officials say better use of global resources will boost design efficiency by 25% to 35%.

How do you provide information technology support for such far-flung operations in 30 countries? What gets globalized and what doesn't? Bill Powers, Ford's new executive director of IS and research, follows a rough guideline: "Anything that is basically purely technical should be global. As you run toward business, you hit a gray zone. Anything close to actual customers—sales and marketing—or employee relations should be more local. Data resides locally, but it's linked to a global system."

In other words, globalize only as needed. To support worldwide design, Powers' teams have deployed 500 Silicon Graphics, Inc. workstations, 90 Oxya Graphics computers and two Convex

Continued on page 38

# ABB Asea Brown Boveri

IS juggles the paradoxes of international, multidomestic ABB without dropping the ball on centralized computing

**T**HE WORLD'S LARGEST electrical engineering firm, ABB Asea Brown Boveri Ltd., began life by tackling global computing complexity. ABB hasn't stopped since.

Formed in 1987 by the merger of engineering giants Asea AB in Sweden and BBC Brown Boveri Ltd. in Switzerland, ABB gave its information systems personnel a daunting task: to create, within months, a single financial reporting application for 1,300 companies employing more than 200,000 people in 140 countries.

"You know how that goes. The IS people may say it's going to take two years to develop, and we say, 'No, guys, it should be ready the first quarter of 1988,'" says Bengt Skantzze, a corporate development manager who now manages ABB Group Information Systems.

"And it was ready the first quarter of '88."

Today, the unified reporting system remains one of Zurich-based ABB's few standard applications.

The \$28 billion giant continues to balance the paradoxes facing an "international, multidomestic organization." The company considers itself global but with deep local roots, large overall but individually small, with 5,000 profit centers, decentralized but with centralized reporting.

Indeed, Skantzze says his current challenge is balancing a diverse, decentralized structure while leveraging centralized efficiencies in purchasing and other operations. It's a big job. Even more remarkable is the fact that he directs ABB technology on a part-time basis with only two staffers. "We're lean and mean," Skantzze chuckles.

How do they do it? IS operations mirror a two-dimensional company



• ABB Group Information Systems manager Bengt Skantzze and his small staff balance a diverse, decentralized structure while leveraging centralized efficiencies in various operations

matrix. An IS steering committee serves major geographic and business entities. Each group meets several times a year to approve budgets and ensure that technology plans fit overall company direction. Committees comprise the top IS manager, financial officers, board members and chief executive officers. IS managers serve each of the three geographic regions, five business segments and 45 business areas.

Each business chooses its own applications, but ABB has standardized its office automation infrastructure. The company began rolling out Lotus Development Corp.'s

Notes II months ago. "We have one chance in a lifetime to standardize because it's something new," Skantzze explains.

ABB now boasts 13,000 Notes users worldwide. "ABB is an interesting example of how companies can move, in this case to Notes, to build a global information infrastructure cutting through the national hierarchies," says Sean Phelan, an analyst at The Yankee Group in Watford, England.

Beyond that, some 1,000 staffers populate major IS centers in Sweden, Germany, Switzerland and the U.S. These centers house mainframes that handle host-based applications. For a changeback fee, IS staffers also help install client/server systems for ABB companies.

IN WATFORD BY MARK PARAGRETS, ENR News Service  
ROMAN PHOTO BY PHILIP

At a glance	
ABB has 1,300 companies in 140 countries	
Annual IS spending	\$780 million
IS spending per employee	\$3,300
Annual IS spending as % of revenue	2.8%
Number of IS employees	5,000

## Global Titans

Continued from page 16

Computer Corp. C4 supercomputers. Ford says the approach will trim product development time from 36 months to 24 months, and save \$1 billion to \$4 billion starting with the 1999 model year. The firm also boasts worldwide purchasing and parts systems.

**A sturdy backbone.** If there's a single technical factor that CIOs say will power global growth, it's infrastructure. Indeed, belief runs strong that a solid technological skeleton of networks, systems, standards, people and processes can not only serve as a distributed cyberbrain of the wired organization but also act as trade routes for the global village.

Not surprisingly, top Global 100 firms are extending and improving their networks. United Parcel Service, Inc. is expanding its U.S.-based wireless radio network for worldwide use. Barclays is growing what it claims is Europe's largest virtual private network. Toyota's task is enhancing its global network.

It's paradoxical, but CIOs say such strong global frameworks enhance rather than restrict flexibility. The reason is simple: Applications and communications links can be created and deployed far more quickly using existing pipelines, platforms and

Today, Chase is counting on that strong backbone to speed roll out of its new worldwide trading floor system. Phase one, 500 new seats in New York worth \$95 million, was completed in March. London, Tokyo, Hong Kong, Singapore and Sydney will be linked, possibly via 100Base-T or Asynchronous Transfer Mode.

Strong infrastructure also opens the next frontier: linking suppliers with customers. Global firms are busy reinventing traditional channels using information technology.

For example, Ford plans to link Mazda Motor Corp. and other partners this year. Powers says, Deutsche Bank is expanding use of its international network for delivery of products such as money transfers, securities, derivatives and electronic banking. Gerard says, And Kao has created several systems for exchanging information with distributors, retailers and customers.

**Big world, big problems.** Despite impressive strengths, global leaders also face titanic headaches, including unthinkably complex integration, worldwide shortage of skilled IS labor, thousands of legacy applications and blurring technological change.

Yet outside factors may pose even bigger challenges. Laws governing transborder data transmissions remain an inconsis-

# Increasingly, technology bosses aren't technologists.

standardized components. That explains why companies in this group are rapidly adopting global standards for everything from architecture, information and electronic mail to LANs, software development tools, user interfaces and even desktop software.

Client/server and open systems also play key roles. Deutsche Bank, for example, is migrating 70,000 Novell terminals and PCs to OS/2. Glaxo, which just named its first worldwide director of infrastructure, is switching from IBM mainframes to Hewlett-Packard Co.'s HP/UX and AIX. The world's second largest drug maker is also standardizing on Oracle Corp. databases, TCP/IP and Microsoft Corp.'s Windows NT. UPS claims to be North America's largest client/server user, with 100,000 seats.

The common goal of such efforts? Better use of global resources. As Phillips' Milim says, "We want any employee anywhere to access our enterprise technology." Or as John Handy, Glaxo's group information technology director, says: "The more effectively we can share ideas, the better we will work."

Toshio Hiratsuka, director of Kao's systems development department, explains, "In the past, information only passed from top to down. Now we are trying to provide information to anyone."

That's the goal at Chase, too. Since the late 1980s, the financial giant has invested heavily in an integrated voice and data network that serves 30 countries. Novell, Inc. LANs are globally connected. Nearly every one of Chase's 20,000 PCs are linked to its new \$80 million Metrotech center in New York. Videoconferencing unites 30 global locations.

test mess. During the next 18 months, global consortia formed by AT&T Corp., MCI Communications Corp., BT, IBM's Advantage unit and others plan to introduce new worldwide services. Analysts say convenient, reasonably priced global networks could erase many competitive advantages heretofore enjoyed only by wealthy megacorporations.

Ditto for the Internet. Most big, global corporations have a home page on the World Wide Web but limit activity to advertising or providing information because of security concerns.

Edward M. Roche, a research fellow at the University of California at Berkeley who specializes in multinational electronic commerce, says the continued success of today's global corporations will increasingly depend on how well they adapt to the new "postglobal" era of virtual alliances and organizations.

"The big question is, how do you seize territory in cyberspace for your company?" Roche says. What counts more, he adds, is exploiting infrastructure — public or private, virtual or actual — to create the most effective means of making your company's information and services available.

Global CIOs recognize that the task is Herculean. Nike's Kretzberg acknowledges: "There is no finish line."

BY MALLORY A. BENDER EDITOR, COMPUTERWORLD USA, CONTRIBUTED BY DEBORAH ALAN ALLEN, COMPUTERWORLD USA, IDG NEWS CONSENSUS/STAFFERS BRUCE IN MONTE, BEN COHEN AND MICHAEL PERKINS IN LONDON, CARA COHEN/ALAN AND MARK FORD/IN PARIS, AND BOB GUY IN TOKYO

# Toyota

Globalization has driven the auto giant to branch into the U.S. and Europe for manufacturing, R&D and suppliers

**W**ITH AN EYE TOWARD integrating worldwide operations, information systems are helping Japan's No. 1 automobile exporter maintain quality and service as it transcends its Japanese origins.

"Toyota, operationally, is the most amazing thing on the planet," says James Womack, former research director of MIT's International Motor Vehicle Program and lead author of *The Machine That Changed the World*.

Toyota became "amazing" by continually improving and simplifying its manufacturing processes, not by overinvesting in computers or gathering data it could not use, experts agree. The company is careful to apply technology and informa-

tion to provide better service, it has built applications such as the Lexus customer data base, which lets any Lexus dealer access a customer's service records by satellite.

At the same time, workers at Toyota's factories and its suppliers' facilities will rely on cards, called *kanbans*, and other simple visual cues to trigger steps in the production process. It is no accident that a Toyota IS video begins "It's necessary we select only the most important information for use in our business activities."

But globalization has affected Toyota's sense of what is appropriate and necessary. Because of pressure from Japan's trading partners and the strong yen, which has inflated the carmaker's costs, Toyota can no longer manufacture exclusively in Japan or rely on local Japanese suppliers that are used to the *kanban* method. The company now has factories in America and Europe, conducts re-

At a glance	
Toyota has facilities in more than 26 countries	
Revenue	\$94.6 billion
Profit	\$1.97 billion
Annual R&D spending	\$3.6 billion*
Number of U.S. employees	1,026

\*Source: Industry reports for fiscal year 1993 and management estimates. \*This and Toyota's policy publications are subject to change without notice.

its IS best? For one, on global networks that enable Toyota to gather worldwide sales data, use it to forecast production requirements and transmit accelerated production schedules in suppliers. For another, on using electronic data interchange to supplement *kanbans* so Toyota's most distant suppliers can keep up with its just-in-time requirements.

"Our No. 1 task is enhancing our global network," says Kensuke Nagane, general manager at Toyota's system planning department and a three-year veteran at its Georgetown, Ky., plant. The network includes 6M to 12M bit/sec. links among the company's three main offices — Toyota City, Tokyo and Nagoya — as well as 64K to 6M bit/sec. digital connections to its major suppliers, factories and sales offices throughout Japan. AT&T Corp. provides frame relay data links between the U.S. sales organization and its Tokyo office, while Mercury Communications Ltd. and Belgacom provide links to Europe.

Toyota plans to connect its U.S. suppliers to its network and is giving serious consideration to upgrading its network to multimedia capability. One possible application is multimedia catalog car sales in Japan. The automaker is also considering expanding its network into Asia and selling cars via the Internet.

BY WRITER BY ALLAN E. ASTER, A COMPUTERWORLD USA SENIOR EDITOR, AND BOB CYTEL, AN EDG NEWS SERVICE CONTRIBUTOR IN TOKYO.



• **Toyota's Kensuke Nagane:** "Our No. 1 task is enhancing our global network," which now links the company's three main offices as well as connecting to suppliers, factories and sales offices in Japan

tion only where appropriate.

For example, the automaker has created for its engineers its own computer-aided design and manufacturing systems, which it sells through its Toyota Caelum, Inc. subsidiary. And to help car dealers

search and development in California and Belgium, and imports American-made Camrys into Japan. And in North America alone, the auto giant has approximately 450 suppliers.

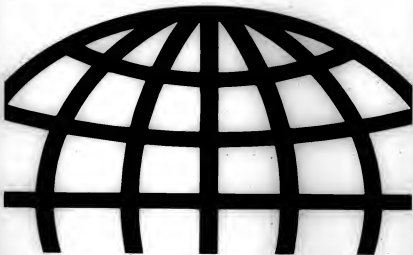
Where has a globalized Toyota placed

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## A Global Challenge

**A**S COMPANIES ADOPT A GLOBAL APPROACH TO BUSINESS, IS managers need to prepare for a new set of challenges. To graduate from multinational to global status, a company must change technical infrastructures and work processes. IS executives should be prepared to adopt a sophisticated mix of flexibility and structure for the transition. The same sort of contingent approach to information technology strategy — moving from a one size fits all method to recognizing the individual needs of business units — that has enabled organizations to achieve superior alignment between technology and business is even more valuable when a company is driving a globalization effort. For many reasons, IS executives should develop a strategy and a governance structure that balances the needs of the enterprise as a whole with the needs of local units.

There are many fundamental differences among locations that must be accommodated by IS services and products, including time zones, languages, regulatory environments and basic technical infrastructures. A successful strategy accommodates these differences.

That's one reason why any globalization effort demands new levels of communication. More than ever before, an organization's information technology infrastructure must be prepared to support effective enterprise-wide communication. This is a key role for IS. Those organizations that have already laid the groundwork for a standard infrastructure have a distinct advantage.

Some organizations have the resources to literally rise above these challenges by using satellites in their communications systems. With a proper telecommunications architecture in place, organizations will find it much easier to leverage on a global scale many of the same practices that have allowed them to maximize domestic technology investments.

For example, one company might take advantage of the time zone difference between its East Coast data center and its Asian off-creating units, handling all processing from the East Coast during off-peak hours. This not only enables the company to close an Asian data center but actually improves response time.

A well designed and properly implemented communications infrastructure not only enables companies to adopt best practices and tap new labor markets but also facilitates the kind of ongoing dialogue that is essential to keep far-flung business units aligned with the enterprise mission. Without an active dialogue, outlying units can become resentful of a corporate direction they feel is being imposed on them, and headquarters may adopt approaches that are ill suited to local realities. Companies must communicate effectively if knowledge transfer is to occur on a global scale.

However, strategy and infrastructure only take you so far. To go the distance, be prepared to travel a lot. Many IS executives spend so much time on the road coordinating global information technology activities, their home offices are constantly empty.

Information technology is at the heart of an enterprise's ability to adopt a global approach to business. That means IS executives can count on adding a new layer of complexity to their already demanding positions. But there are benefits as well. Because information technology is a key enabler to this dominant business trend, IS executives are in a position to create new alliances, refine their entrepreneurial skills and demonstrate to senior management that they can deliver the services and products that drive global success.

*Mary Silva Doctor*

Mary Silva Doctor  
Ernst & Young, Boston



# Public Sector

**T**O SAY THAT PUBLIC SECTOR IS ORGANIZATIONS AROUND THE WORLD ARE STRETCHED THIN THESE DAYS would be something of an understatement.

Governments and other public sector organizations are knocking on information systems doors for help in increasing the efficiency and reducing the cost of operations. And if this isn't challenge enough, these groups are also enlisting their IS shops to expand government services to an increasingly demanding citizenry.

The IS departments, of course, are being asked to do all this within austere budget environments. The *Computerworld Global 100* includes several organizations, profiled below, that have managed to deliver, despite the demands they face.

## Metropolitan Toronto Police Toronto, Ontario, Canada

**I**N THE LAST TWO YEARS, the information systems department of the Metropolitan Toronto Police has saved the force \$21.3 million in cost savings, cost avoidance and increased productivity, says Roger Mahabir, director of computing and telecommunications.

That's a far cry from IS's track record prior to 1992, says Inspector Bill Blair, an 18-year Toronto Police veteran. Then, officers were hindered by a system in which records were badly sorted and information was often misplaced.

"We are essentially an information gathering agency, and we were doing a very poor job," Blair says. "We were collecting the same information over and over, in various states of completeness. In trying to get a clear picture, you'd come up with conflicting things or partial information."

Mahabir was hired in 1992 to turn things around. Blair says. Since then, the force's IS department has migrated many of its applications from its Unisys Corp. A16 dual processor main frame, which used approximately 700 dumb terminals and first generation workstations, to 70 interconnected Ethernet LANs employing 60 IBM RS/6000 servers linked to more than 4,000 clients, which include IBM PS-2s and mobile dumb terminals used in police cars. Some applications still reside on the main frame, which continues to function as a data warehouse.

Dubbed Metropolis, the new system handles functions such as computer-aided dispatch, centralized occurrence processing,

integrated computer imaging, including a database of mugshots, and criminal information processing.

The improvements in IS efficiency are also helping make Toronto safer by freeing beat police from administrative tasks and allowing them to do "more community-oriented, problem solving policing," Blair says. — Peter Woldak, *Computerworld Canada*

## Information and Decision Support Center Cairo, Egypt

**F**OR EGYPT, INFORMATION TECHNOLOGY has become more than just a means of improving operating efficiency. It has become a mission to bring the country into the 21st century. At the forefront of Egypt's drive to computerize is the Egyptian Cabinet's Information and Decision Support Center (IDSC), formed in 1985 not only to design and implement the Egyptian government's technology and decision support infrastructure but also to develop a software industry and high-tech industrial base.

While the IDSC is moving to client/server applications, downsizing and off-loading applications from its IBM ES/9000 Model 260 mainframe to Unix-based workstations, it is also moving older technologies such as Intel Corp. 80286 PCs and DOS-based applications to areas of the country that are not yet computerized.

Topping the IDSC's list of significant information technology projects are the following:

## Government Agencies

Not all that glitters is in the private sector.  
Some governments have harnessed the power of IS.

- **The Debt Management Project**, a management information system to monitor and analyze Egypt's debts
- **The National Budget Project**, a national budget database with fiscal analysis tools
- **The Customs Reform Project**, a decision support model to help a comprehensive tariff structure in 1986
- **The Legislation and Decrees Project**, a database of all laws, laws and decrees issued by the Egyptian government since legislation was first passed in Egypt in 1824
- **The National Security Number Project**, one of the largest multimillion dollar data entry projects in the world, designed to automate the production of identity cards and other official government documents for Egypt's 60 million citizens — Cheryl Robertson Wajda, *Computerworld Middle East, Egypt*

### Japan Finance Corp. for Small Business Tokyo, Japan

**W**ITH THE AID of a client/server system, the Japan Finance Corporation for Small Business (JFCSB) has re-engineered the role of the banker from loan officer to business consultant. JFCSB helps ensure that Japan's small to medium-size businesses receive the long-term financing they need to grow, even when it's difficult for them to obtain credit from commercial banks.

Until last year, JFCSB's 1,200 bankers could do little more than shepherd applicants through the loan process. Now the Relationship Intel-

ligence Proposal system provides JFCSB bankers with three kinds of information they can share with clients, says JFCSB officials and Tokyo University Prof. Yutaka Umezawa.

- **Sharing experience.** Using electronic mail, bankers can solicit practical suggestions from colleagues whose clients have had similar problems. This information is gathered into case studies and filed in an "electronic cabinet" for future reference. More than 300 case studies have been stored so far.
- **Benchmarking.** JFCSB's client database, which contains more than 100 information fields, can be used to help any client compare its costs and performance against the agency's 50,000 clients.
- **Matchmaking.** JFCSB can match clients that are opening new factories or moving to new facilities with suitable suppliers and vendors in their new location. — Allan E. Alter, *Computerworld USA*, and Rob Cook, *IDG News Service, Tokyo*

### Inland Revenue Department Auckland, New Zealand

**S**INCE THE mid 1980s, New Zealand has moved away from being one of the most highly regulated economies in the world. As a result, its government agencies are learning to be more flexible. This was difficult for the Inland Revenue Department (IRD), given its outdated technology, including a more than 30-year old Cobol-based system with a Goods and Service Tax system developed in 1984.

In 1988, under the aegis of then Commissioner of Inland Revenue David Henry, the department proposed a plan to modernize its computer systems and reorganize business processes. Andersen Consulting helped implement the \$128.6 million project, known as the Future Inland Revenue Systems and Technology, or FIRTS.

The IRD selected Sun Microsystems, Inc. to provide about 240 network servers as communications devices for its wide-area network. These serve 300 PCs and terminals and about 800 terminal devices. There are about 2 million machine transaction inquiries per day, with an average mainframe response time of two seconds or less. FIRTS is due for completion in March 1996.

Information technology "will go hand in hand with the business drivers," says information systems manager Peter Jonckheere. — Randall Jackson, *Computerworld New Zealand*

### Department of Social Services Lansing, Michigan, USA

**F**OR THE Michigan Department of Social Services' 14,000 employees, "the workload is very high, there are enormous amounts of paperwork, and the policies they have to apply are extremely complicated," says Norm Charles, the department's chief information officer.

Most of these employees are in the business of delivering services or determining eligibility for the state's Aid to Families with Dependent Children, Food Stamps, Medicare and other programs. Charles oversees the systems that determine recipient eligibility, track cases and process payment.

The Department of Social Services is in the midst of a sweep

*Continued on page 24*

## Government Agencies

Continued from page 23

ing overhaul of its information technology infrastructure. The department's plan is to replace its centralized data processing structure with a three-tiered architecture of mainframes, Unix-based departmental servers and PCs. The workstations will manage communications between the central mainframe and the regional offices and will also provide local applications processing.

Key applications such as eligibility and payment processing are being re-engineered to run in the distributed environment.

Charles says he believes the new system, slated for completion in 1997, will boost productivity, reduce errors and help employees provide "infinitely better service."

The department plans to invest \$120 million in the project over three years, but Charles says the information technology expenditure will yield \$80 million to \$90 million in annual savings. Much of that savings will come from improved accuracy in determining eligibility and processing payments. — John Moore, Federal Computer Week USA

### Department of Information Services Olympic, Washington, USA

**F**ACING TIGHT BUDGET PRESSURES, Washington State's Department of Information Services is using information technology to create some innovative citizen programs.

While generally in the business of providing services to 147 state customers, last year the department helped develop information "kiosks" in cooperation with IBM and 19 state and federal agencies. The kiosks will directly provide the public with a range of services.

With the Washington Information Network, launched in August 1994, Washington joins a handful of states that have deployed kiosks in the front lines of citizen service. Washington's program has 10 permanent kiosks and one floater that rotates among shopping malls and other public areas, according to George Lindamood, director of the Department of Information Services.

Each kiosk offers 42 applications, including job listings, student loan information and data on vehicle registrations and licensing procedures. The most popular application so far is a job search service provided by the state employment department.

Lindamood also plans to help state agencies link their isolated PCs and adopt a standard suite of end user applications that would include electronic mail, scheduling and Internet access.

"We are encouraging agencies to put information up on our Internet server," Lindamood says, "to give citizens direct electronic access to government information and services."

The department's public and internal advances, however, have come on the eve of a major budget squeeze that is scheduled to take effect at the beginning of the state's fiscal year in July.

To maintain its level of service, the Department of Information Services has proposed to the state legislature that it become a not-for-profit corporation. "That would take us off the balance sheet [and help us] depoliticize information services," Lindamood says. — John Moore, Federal Computer Week USA



## Island of Automation

**F**OR REPRESENTING ITS SMALL SIZE, 593 square miles, the island republic of Singapore boasts an impressive information technology infrastructure. As early as 1981, Singapore's government recognized that investing in information technology would attract foreign business and distribute government services.

That's the year Singapore created the National Computer Board (NCB) to oversee the nation's information technology strategy. One of its first tasks was to implement the Civil Service Computerization Program. Under the program, all of Singapore's ministries and state agencies have been computerized, with more than 100 mainframes and minicomputers and more than 10,000 workstations.

A decentralized reporting structure helped the NCB develop systems quickly, says Koh Ewe Suan, senior director of the NCB's Government Systems Division.

And the NCB is getting everyone to use electronic mail to create user enthusiasm for the system. The E-mail application sits on top of the InterDepartmental Network, the information infrastructure for the civil service agencies, Koh says.

NCB is also exploring new information technology solutions, such as Singapore's Broadband Mode (VPL), says Wong Joon Tai, information systems manager at the Education Ministry. "We may consider 100M bit/sec. Links as a starting point, but for 1995, that will depend on NCB's availability and cost," Wong says.

Koh says partnering with the private sector lets the government take advantage of technologies that exist in the marketplace. "What we develop are specific applications for each ministry," he says.

Singapore Network Services, a network provider that connects the private sector with government departments, works closely with the NCB. Using files from Singapore Museum, Singapore Network Services provides electronic data interchange (EDI), E-mail and database services, says Choo Kah Chuan, deputy managing director at Singapore Network Services. Its goal is that by mid-1995, it should have an interactive EDI system in place that will let importers and exporters submit documents electronically.

"The response time [using EDI] is about 15 minutes, compared with one to two days under the manual system," Choo says. Singapore Network Services hopes to net that in two or three minutes, he adds, to "establish a competitive edge over other network operators in the region."

In spite of service improvements like this, there is as much to fret on one's horizon, Koh says. "Today's needs have been met, but tomorrow's we'll always have to improve ourselves for the future," he says.

—Written by Solomon S. Emmet, a staff reporter at Computerworld/Singapore, with contributions from Gerald Wee, editor of Computerworld/Singapore



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Illustration by [illegible] for [illegible] No. 100, 1995

## Japan

# More important than investing in the latest hardware, Japanese companies look for technology that fits the way people work

**T**he Japanese make a distinction between *tatami* and *honne*. Roughly translated, it's the difference between how things appear on the outside and what is really going on inside. It's a useful distinction to make when you look at the state of information technology in Japan.

By **Allan E. Alter**  
and **Rob Guth**

From the outside, Japanese businesses can appear behind the times in their use of information

technology. Visit any major corporate office in Japan and you will spot fewer PCs or workstations than you would in the U.S., even at the systems development department at a major bank. Studies show that PC use is relatively low in Japan, and few Japanese PCs are networked. Users frequently share PCs, and big iron still dominates.

Counting PCs, however, misses the point. Most of the Japanese companies on the Global 100 list have created large, highly integrated information technology architectures to operate their businesses. Computer magazines are increasingly displacing comic books as subway reading for young salarymen. And information systems managers at a number of companies now list Internet addresses on their business cards.

**Seeking harmony.** The *honne* of Japanese IS really shows in the names Japanese companies give their information systems, which may contain words such as "relationship" and "harmony." One example is NSK Ltd.'s *Challenger*, which stands for Carry and Harmonize All Enlarged NSK Global Enterprises through Real-time Systems.

These systems reflect Japan's distinctive approach to IS. In a society where greeters bow to department store shoppers, car salespeople make house calls and face-to-face contact is considered crucial to getting anything done, Japanese companies use computers to enhance and support human relationships rather than replace them.

"We are not making computer systems but man-machine systems," says an IS manager at The Dai Ichi Kangyo Bank Ltd. Consider Japan's approach to the automated teller machine (ATM). ATMs can complete cash transactions in as few as eight seconds and are routinely used to pay bills or

debts to family and friends, says Shin Takeshita, general manager of the systems administration department at Nomura Research Institute Ltd. Yet they shut down during evenings and weekends, require personnel to oversee them and have telephones so customers can call a bank teller. The reason Japan's ATMs were conceived as extensions of, not replacements for, tellers.

Toyota Motor Corp., for example, keeps technology and people in balance by relying on simple processes and ways to communicate (see page 19).

The search for harmony extends to Japan's approach to business process re-engineering. Unlike the West, Japan's re-engineering experience has not become completely identified with head count reductions.

To be sure, Japan's protracted economic downturn and the devaluation of the U.S. dollar are forcing many Japanese companies to jettison off employees through retirement and relocation schemes. However, early attempts to slim middle management, such as Pioneer Electronic Corp.'s retirement plan in 1993, were met with public outcry. Companies are under intense pressure from the Japanese public to cut costs without cutting people.

Even Japanese companies that are replacing employees through computerization are "carefully searching for a harmo-

*Continued on page 30*

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## Japan

# In a society where car salespeople make house calls, Japanese firms use computers to enhance and support human relationships

Continued from page 27

ness balance between the need for introducing more computers and reducing the numbers of workers in the workplace," says Kameki Takamatsu, executive director at the Japan Institute of Chief Information Officers in Osaka.

Some organizations have a different approach to re-engineering. Re-engineer value into their people. The "Relationship, Intelligence, Proposal" system developed by the Japan Finance Corporation for Small Business (JFCSB) is one example of employee-friendly re-engineering, says Yutaka Umezawa, an economics professor at Tokyo University (see story page 23).

JFCSB's system gives its bankers information that enables them to act more like business consultants. Yet the customer never sees or accesses the system. JFCSB's bankers take computer printouts to the customer's office and work face to face. As a result, the system strengthens the personal bond between banker and customer. "The most important thing is not to make the machine more clever but to take the banker to a higher level," says Ken Takeuchi, executive director.

Mitsumi Corp. has taken another approach, which is to minimize the need for staff in the first place to better avoid staff reductions. With 300 employees (including an IS staff of 11), the Tokyo-based trading company handles auto and consumer electronics parts orders from 27,000 customers, says Hirobumi Inokuma, an executive director at Mitsumi. This often means making tough decisions, such as to use an on-line service instead of an in-house network for exchanging information within the company's head office. "Once we install a LAN we have to support it, and besides, the cost [of the service] is cheaper," he says.

Japan's most innovative companies go the extra mile to gather customer feedback. Kao Corp., a personal care products company, uses IS to share and gather data in ways that strengthen its relationships with distributors and consumers.

Because it could not "see the face" of its customers using com-

plex, conventional distribution channels, Kao bypassed those channels by creating 10 Himebu, which are independent wholesalers that distribute only Kao products, says Toshio Hirasaka, director of the systems development department. Today, IS helps these companies support and exchange information with retailers. Himebu sales advisers provide that necessary personal contact with store managers.

Kao's Echo system also connects with consumers by providing information and gathering data on the 40,000 callers who contact Kao's toll-free lines each year. Kao staffers also conduct door-to-door surveys of customers.

Office computing is one area where disharmony between computers and people still exists. Minoru Yoshikawa, general manager of the information systems department at Tokyo Electric Power Co., has become interested in electronic mail because it promises to "eliminate unnecessary middle-level management work," lower labor costs and improve data sharing, even though the utility's staffers work in traditional Japanese fashion: in long lines of desks facing one another. The company already has 8,000 terminals communicating by E-mail.

But E-mail raises cultural issues. For example, to achieve consensus, managers circulate reports on paper and affix a personal seal to mark their approval. "You need

to get approval with the seal to feel safe," says one member of Yoshikawa's staff. He wonders how that would work with E-mail.

Members of Japan's IS scene are often critical of computer vendors, older executives who don't understand computers and the state of PC use. The need to reduce costs is evident. But given the determination of the Japanese to recover from the recession and their knack for combining people and technology, as well as their insight into using information systems to strengthen human relationships, outsiders shouldn't underestimate Japan's IS by taking Japanese self-criticism at face value.



Kao's Toshio Hirasaka: Kao created Himebu sales staffs to "see the face" of its customers.

AN ADLER IS A COMPUTERWORLD USA SENIOR EDITOR. GUTER IS AN IDC NEWS SERVICE CONTRIBUTOR IN TOKYO.



## Japan's New Model

**J**APAN'S IMAGE TO THE WORLD AND TO ITSELF is that of a slow, changing, tradition-bound nation. The status of information technology in business matches that image. This perception, however, is not entirely accurate. Japan has experienced short periods of turbulent change in its long history, such as the reindustrialization after World War II and the leap to global leadership in consumer electronics in the 1970s and 1980s.

Now the country is poised for another burst of rapid change, enabled by information technology and led by two revolutions: the deregulation of Japan's retail industry and the aging of the workforce.

Deregulation is creating a class of entrepreneurial companies that are raising expectations for value and customer service. Meeting these expectations will provide the creative energy for rebuilding Japan's cumbersome distribution chain. Japanese business will develop industrywide standards for sharing information, multicompany networks and real-time delivery of information to front-line employees.

The aging of Japan's workforce dooms its lifetime employment system. For much of corporate Japan, the cost of carrying an overhang of middle-age managers represents the difference between profit and loss. Tasks such as data collection and analysis and internal coordination and communication will be either replaced by technology or performed by employees supported by information technology.

As a result, a new economic paradigm is emerging that replaces the machine icon with the organism. Before, business was supposed to possess machine-like predictability based on a standardized mass market. This assumption allowed for centralized accumulation and analysis of information and the installation of standardized procedures. The model drove Japan to superstandard but left an undesirable legacy: strategic planning staffs with lots of power, rigid operating procedures, high costs and little customer responsiveness.

Now, using the organism as the model, variation, adaptability, uniqueness and unpredictability will be encouraged. Responsiveness and flexibility will become competitive advantages, local initiatives will be rewarded, and coordination and communication will be direct. Information technology will provide the nervous system for this new business organism.

Of course, these changes will bring upheaval. Instead of being guarded by a bureaucracy and controlled through seniority, information will become fluid and ubiquitous. This will bring authority to those employees who are in close contact with customers.

It has taken the U.S. several decades to work through these changes. However, the Japanese have advantages that will help them move more rapidly. Japan's emphasis on speed, quality and teamwork as well as its tendency to take a long-term, holistic view of business will work in its favor. In addition, Japanese business's proven ability to focus intensely on a key strategic issue means that once action is decided on, it will be carried out.

All of this has implications for the rest of the world. New organizational and technological models will emerge in Japan from which others can adapt and learn. Expect to see renewed competition from the Japanese, not only in computer hardware and heavy manufacturing but also in the service and software arenas — areas in which they've been laggards.

Non-Japanese firms can look for opportunities to provide the know-how for these dramatic changes as Japan wires itself for the 21st century.

**Bobbin Munkes**

CSC Index, Inc., Tokyo





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# Border Crossings

Illustration: Mark Apple; Photos: © 1993, PhotoDisc, Inc. 10-10-93

## Western Europe

**D**ESPITE EUROPE'S MOVEMENT TOWARD TELECOM LIBERALIZATION and a single currency, it remains for the near term a conglomerate of disparate markets. Optimism for a "borderless" Europe is not high, says Josée van den Berg, business development manager at International Data Corp.'s Network Expertise Center in Amsterdam. National politics continue to play an important role in preventing a truly borderless market. For example, though European Union rules say approval of a product by the European Telecommunications Standards Institute in one nation allows that product to be sold anywhere else in the union, in practice, different nations still require their own testing against the institute.

*By Marc Ferranti and  
Gara Cunningham*

By Marc Ferranti and  
Cara Cunningham

U.S. network vendor 3Com Corp. is challenging the practice, under which companies must go through physical inspections that can take four to six months in each country.

Many of Europe's top businesses, such as electrical engineering giant ABB, Anglo-Brown Boveri Ltd. in Zurich or Deutsche Bank AG in Frankfurt, grew to their current size through mergers with firms in other countries. As a result, in the late 1980s and early 1990s, they were left with heterogeneous computing environments — different operating systems, hardware platforms and software — in connected by underlying data and telecom infrastructures.

Laying a computing infrastructure to achieve efficiencies of scale involves making decisions on issues such as standards, out sourcing and centralization vs decentralization. These issues can present big headaches when crossing borders.

This was the problem faced by Paris-based Europcar International SA.

Following a series of acquisitions, which culminated in

1989 with the merger of European and Frankfurt based Interrent. Autoversuchung GmbH, top management at European realized the inherited budget of reservation networks across Europe would not support the company's growth. Nor would it allow the company to compete effectively with rivals Avis, Inc. and Hertz Corp.

"After the recession of the last few years, companies are focusing on their core competencies," says Glean Cuthbertson, vice president and research director of IS management at Gartner Group, Inc. in Windsor, England.

Kvaerner A.S., an Oslo-based company, has also decided to focus on what it knows best: ship building, pulp and mechanical engineering.

under way with two short-listed alliances: AT&T Corp./Unisource and BE/Telenor International.

The \$3.5 billion Kvaerner, which is investing up to \$90 million in research and development, is supported by a global high-speed network that will connect its worldwide sites with bandwidths up to 8M bit/sec. The result will be a regional frame relay information highway with dynamic bandwidths from 32K to 128K bit/sec connecting the company's main sites in Europe and Asia.

Industry insiders maintain that it makes sense for firms downsizing IS staffs, focusing on core competencies and outsourcing data communications to go with the national monopolies within country borders and international service providers outside borders such as Sprint Corp., Eunetcom SA in Paris or Unisource in Hoofddorp, the Netherlands.

But even for companies that outsource the construction and maintenance of their datacom infrastructure, telecom

*Continued on page 28*

Continued on page 28

**A borderless Europe is a nice idea, but it's not reality. National regulations complicate the building of a Pan-European IS infrastructure.**

Faced with a patchwork of information systems groups at its nine European subsidiaries, Europcar outsourced its autonomous national IS groups in 1991 to integrate Perot Systems Corp. The contract includes developing and maintaining an integrated reservation, financial and fleet-tracking system.

ing and equipment manufacturing for the off-shore oil industry. It is limiting the development of advanced in-house information warehouse expertise by outsourcing its planned Kraemer Internal Global Area Network to an international network vendor, says project manager Per E. Enderlund, Neobusiness and

## Western Europe

Continued from page 35

infrastructure isn't basic free. Pharmaceuticals giant Glaxo Holdings PLC, for example, has outsourced its virtual private network to Sprint. "Western Europe is relatively easy," says John Handly, group IS director at London-based Glaxo. But the quality of lines in Eastern Europe is poor, he added, so Glaxo lets Sprint build the network throughout Europe.

"Even so, you can't switch your brain off and not worry about it—you have to get involved," Handly says. "All the big communications service companies claim to offer world-wide services, but none of them are as global as they claim."

Some firms with communications expertise decide to create their own centers of expertise. Technically, establishing a telecom and datacom network is no harder in Western Europe than in the U.S. IS managers say. But national policies complicate it.

"There are no technical obstacles to data transport at the level of interconnections, but there is the cost associated with the old-style telecoms because we still have to obey legal restrictions," says Rudolf Marty, IS applications development manager at Zurich-based Union de Banque Suisse.

"The liberalized laws will make it less expensive because we are not able to provide services to others now," says Hans Eschle, chief executive officer at Swissair Information Systems, a business unit of Swissair Ltd. in Zurich. The company has extra capacity for voice, for example, but is only permitted to use it for itself, he says. Swissair has a highly centralized IS structure that offers networking, systems integration and advice industry-specific technology services.

Not only are Swissair's IS centers profit centers, but the firm also extends its services to

external companies and some 130 to 150 Swissair offices worldwide. "In 1991 we made the decision that we had to extend service to third parties to sustain the necessary growth and volume," Eschle says.

For Swissair, it is still a matter of taking advantage of a core competency. "Our reputation is very good on the reservation system side, and we supply software licenses to airlines that can't afford to maintain large IS staffs," he says.

Helping Swissair traverse the globe is the fact that it is focused on a single industry. And though it recently acquired majority positions in Swiss carriers Crossair Ltd. in Basel and Balair CTA Ltd. in Geneva,

Watford, England, "because even though telecom costs are high, supporting many IS staffs in geographically dispersed locations may be even higher."

Centralizing data centers saved Deutsche Bank hundreds of millions of marks, says Peter Gerard, executive vice president. "Currently we are on the way to run only two logical

cause of variances in global banking, Marty says.

Increasing uniformity of business practices, monetary system and liberalized telecom and technology approval laws will undoubtedly promote technology standardization. But how quickly that happens is out of IS managers' hands.

"We need the political will

## Long Journey to a Free Market

**W**ith telecommunications liberalization, as in other aspects of life, the devil is in the details. Though the European Union (EU) has agreed in principle to liberalize voice communications and telecommunications infrastructure by 1998, technical and political arguments are still unresolved. The 1992 agreement, when any country will be able to offer telecom services and even lay its own cable, is to be a truly free market between independent member states still exist across Europe.

"Though data transmission services have already in theory been liberalized, the service providers are at the mercy of the national monopolies because only the national monopolies have control and can rent out infrastructure," says John Pielton, a network analyst at The Yankee Group in Watford, England.

"In Italy, the situation is worse," says Lorenzo Medda, an analyst at International Data Corp. in Milan.

"Although EU law has liberalized data transmission services, Telecom Italia has refused to let service providers use its infrastructure because national regulations have not yet incorporated EU law."

The Italian anti-trust authority earlier this year ruled for Telegem that a service provider in Milan had brought a suit against Telecom Italia in Rome for refusing to rent its infrastructure. Telecom Italia is appealing the verdict. Also, the EU accused Portugal, Greece and Spain from the 1992 deadline, though Spain has said it will be ready.

—Written by IDC/News Service's Brussels correspondent Elizabeth de Bary and Paris Bureau Chief Marc Potiron.

EU Commissioners in Brussels are taking the lead to liberalize Europe's telecommunications.



Swissair was not built up out of a hodgepodge of local companies as was Zurich-based ABB (see story page 17).

"Companies may find it less costly to move their total IS staff into several centralized IS centers and provide support over their network infrastructure," says Sean Pielton, a network analyst at The Yankee Group in

computing centers based on five locations worldwide."

Some firms can maintain a decentralized business strategy and achieve entrepreneurial efficiencies by setting standards in limited areas. Though Union de Banque uses companywide risk assessment and options systems, it is decentralized for most banking applications be-

cause, but we will in any case continue to cross borders for sound economic reasons," van den Berg says.

A FINANCIAL INDC NEWS SERVICE BYLINE CHINA AND CONSUMERISM ACHIEVEMENT IN PARIS. CONVENTIONS IN EUROPE INDC NEWS SERVICE MICHAEL PANDORA AND PAUL LEVYMAN IN LONDON AND JAMES PACE IN MOSCOW.



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## Spinning Europe's IT web

**L**ATER THIS YEAR EUROPE'S BIGGEST TELECOMMUNICATIONS COMPANY, Deutsche Telekom, will be privatized. Owned by the German state and serving some 37 million customers, it is one of the country's biggest employers. Its sale will be the single biggest share issue in German history. In the run up to privatization, Deutsche Telekom has streamlined its internal operations dramatically and — no coincidence — implemented one of the most extensive Unix based information technology infrastructures to be found anywhere in the world.

The fact is, public utilities across Europe are in the throes of fundamental change as they are transformed from state bureaucracies into customer focused commercial operations. It is hard to exaggerate the impact of this re-engineering shift, and it is one in which information technology plays a pivotal role.

In essence, the issues are clear enough. Competitive circumstances demand big improvements in service quality and customer focus and big cuts in operating costs. These changes, in turn, imply wholesale internal reorganization, staff layoffs and, perhaps the biggest challenge of all, the encouragement of customer service cultures.

Remarkably, many of these historically protected organizations have grasped the nettle. They are attempting to recreate themselves fundamentally, and their efforts represent some of the most ambitious change programs ever undertaken in Europe. There is a sense, in fact, that they are making a virtue of necessity and going for quantum change in performance rather than incremental improvements.

This spirit of meeting challenge head on is most obvious in technology investment. For example, one of our clients, an Eastern European railway company, has over the years compensated ingeniously for its lack of access to Western technology. Now it is implementing one of the most advanced goods transport systems in the world. It has jumped three generations in as many years.

It should come as no surprise that so many of these utilities have replaced their old mainframe based command and control systems with technically ambitious client/server architectures. For utilities, client/server technology is proving a key enabler of radical shifts in organizational culture and business processes, such as empowering front line workers to make their own decisions.

This approach is most conspicuous in customer service, where it enables utilities to develop customer service centers that exploit the latest computer telephony integration and offer a single point of customer contact.

This transformation of Europe's utilities is throwing up hard information technology lessons, some of which are technological.

Client/server infrastructures and distributed computing present IS managers with serious control issues, which have exposed the dearth of systems integration and systems management tools we have long taken for granted in the mainframe arena.

While this re-engineering has underlined information technology's contribution, it has also demonstrated its limits. The new technology is necessary but insufficient; it must be applied hand in hand with business process change.

Change management requires proper investment and planning that follows the same rigor as systems delivery. The organizations that successfully manage the people and process change will reap the most value from their technology investments.

**Thomas Kahler**

Andersen Consulting, Frankfurt



# Out of the

The industrialized North may consider the Southern Hemisphere a technology backwater, but don't tell that to these IS leaders

**T**HE NORTHERN HEMISPHERE MAY REGARD ITSELF superior, but it could learn a thing or two from its neighbors down under. For one thing, information technology leaders in the Southern Hemisphere understand change — big change. From four digit inflation in Brazil to the end of apartheid in South Africa to deep recession in Australia, survival south of the equator depends on a company's adaptability.

South African companies have probably endured the most wrenching change in the past few years. Not only are they being forced to rethink how they address their markets, but they also must review their own staff recruitment and development plans. At the same time, companies must adapt to changes in corporate legislation governing taxation, labor relations, social responsibility and computer technology.

The lifting of trade sanctions has brought many leading information technology suppliers, including IBM and Microsoft Corp., closer to their South African customers.

The same type of free-market explosion is occurring in

Brazil as a result of the government's removal of information technology trade restrictions 2½ years ago. The opening of the market has led to a change in the use of information systems in the Brazilian corporate environment, says Persao de Luca, partner and director at Arthur Andersen & Co. in Brazil. "That is the case with client/server platforms, which were embraced by users because they could now buy systems that suited their budget," de Luca explains.

During the last decade, the Australian economy has undergone a revolution of its own. Deregulation, mergers, buyouts and major corporate and governmental restructuring have swept the country and changed the role of corporate information technology and how it is used. Australia's IS managers say their biggest challenge is managing and reacting to substantial change.

"Business needs a rapid response from [information technology]," says Gary Campbell, director of information services at Australian retailer Coles Myer Ltd. "In a changing environment, the challenge is to ensure [that] application development can happen quicker," he says. "We have a

brazil

south • a

# shadows

strategy of reuse of design and components for applications and infrastructure. [We want to be] flexible and responsive to business needs."

**Banking on technology.** While all industries are buffeted by change, banks are particularly vulnerable due to their susceptibility to economic hiccups and heavy reliance on information technology.

In South Africa, the challenge for banks is not only to cater to the increasing number of black professionals who are rapidly advancing in the ranks of the private and public sectors but also to satisfy the needs of the millions of people who are "unbanked." An estimated three quarters of South Africa's adult population of about 25 million do not have any kind of bank account.

First National Bank Holdings Ltd., one of South Africa's four big banking groups, is counting on its installed corporate network to deliver products and services to this sizable unbanked sector. First National has been phasing out its aging ICL 2900 processors in favor of IBM System/370 mainframes. It also implemented a full suite of banking applications from Hogan Systems in Dallas, consolidated its computer centers from seven regional sites to two centralized locations, replaced its national backbone network and



**Quarterly David Burton still relies on mainframes for fast transaction processing**

installed more than 700 new automated teller machines (ATM).

The exercise was arduous and expensive. But Mike Jarvis, First National's general manager for information technology, says the network of ATMs paid off. The bank can now provide "around the clock" banking at almost any location in the country.

Jarvis says the focus of much of the bank's information technology capital expenditure budget—about \$63 million this year—will go toward providing improved delivery mechanisms for First National's growing portfolio of products.

The bank intends to install more than 10,000 IBM PS/2s running OS/2 Extended Edition at its 950 branches throughout South Africa, Namibia and Botswana.

In a similar move, Banco Bradesco S.A., Brazil's largest financial conglomerate, has spent \$200 million on information technology to automate its branch operations and improve transaction processing. "We couldn't find any system that would fit our high volume retailer profile so we had to build one," says Albatzo Borges, Bradesco's systems director.

With almost 8 million financial transactions each day, Bradesco offers a response time of only one second in processing information. According to Borges, time saved was the most

*Continued on page 48*



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Continued from page 41

important result of the bank's technology investment.

Household appliance manufacturer Fisher and Paykel Ltd. in New Zealand has reinvented itself as a client/server enterprise with a single Unix operating system as the glue to unite all aspects of the organization. The Computer Associates International, Inc. Ingres relational database management system is at the heart of the company's flexible manufacturing process. The RDBMS can change product specifications within 20 seconds based on a software decision that's easy to execute.

The company's refrigeration plant, for example, manufactures up to 1,400 different models and is capable of making every model, every day.

Fisher and Paykel's distributed approach using CA's Ingres Star distributed database not only reduces cost and improves performance but also spreads the risk of product failure. According to group IS manager Bruce Caldwell, having a single set of standards as well as eliminating the duplication of software, processing and skills also helps improve flexibility.

The payback of the investment in open systems is already evident. Fisher and Paykel has halved its information technology budget, reducing operating expenditure on systems by 38% and doubling production. Manufacturing productivity is up by a factor of three. Export success in Australia,

Europe, Japan and Asia has trebled over the past five years. 59% of all household appliances are now exported — up from 16% five years ago.

The trends toward client/server and open systems continue, but for many large information technology users to the Southern Hemisphere, mainframes and centralized databases are still of vital importance. Just ask David Burden, executive general manager of information technology at Qantas Airways Ltd., Australia's national airline.

First National Bank  
Mike Davies, IT manager,  
works at ATMs in  
South Africa's cities  
to provide around the  
clock banking, at  
central and sites  
in the country.

"We have incredibly high rates of transaction processing," he insists. "Currently, the only way to handle these, is through our traditional, mainframe-based centralized systems," Burden says. "We have a number of client/server systems, and these will continue to grow, but our core systems still depend on central repositories."

**Reliable infrastructure.** Also working on the premise that centralized computing is key to business management is Brazil's national airline, Varig Brazilian Airlines SA, which moves 9.6 million passengers a year. The more reliable the infrastructure, the better Varig can serve its customers, explains Jose Carlos Sabate, who runs a computer center for Varig, with two IBM 390s, one Amdahl Corp. mainframe and one Fujitsu Ltd. 1400A mainframe central

ling 2,000 machines in Brazil and 1,700 worldwide.

Varig intends to invest \$30 million this year to buy information and telecommunications systems, and it is especially interested in the increase in the processing ability of mainframes. The company reached the mark of 100 transactions per second last December, Sabate says.

Another big Brazilian spender committed to restructuring its information technology is Petroleo Brasileiro SA-Petrobras, the government company responsible for exploitation and production of all Brazilian petroleum. Last year, Petrobras invested \$234.4 million in information systems and \$105 million in telecommunications. One of Petrobras' main projects, started in 1991 and expected to be ready by 1996, is an ambitious plan to turn its 33 computer centers throughout the country into four centers concentrated in three Brazilian cities.

To concentrate corporate and scientific systems in large computer centers and to distribute data processing, some mainframes have been shut down while others are being reallocated. In many departments, substitution of high-end equipment is leading to downsizing processes involving RISC equipment and client/server models.

The challenge for the Brazilian oil company, however, is to fit these and other projects into its "Strategic Automation Plan," designed in 1992 and expected to continue until 2001.

"We want to completely integrate automation and information islands throughout the company," says Jose Carlos Beteencourt, associated support superintendent for the Information Resources Service Department, which is responsible for information and telecommunications activities at Petrobras.

✻ WRITTEN BY KEVIN POWERS OF  
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Brazil's Banco  
Banco takes  
advantage of the  
Brazilian bank's  
'flying bridge'  
between Brasilia  
and São Paulo

# Getting wired

By Torsten Busse

**A**NECDOTES THAT DESCRIBE THE volatile conditions of telecom munications in Eastern Europe are as abundant as the phone connections that drop in the middle of a conversation.

In the Bulgarian capital, Sofia, last year thieves dug up and stole the main copper line connecting McDonald's to the local phone network not once but twice. In the Hungarian capital, Budapest, the editors of the Budapest Business Journal discovered they could not make phone calls when it rained. And in the Polish capital,

telecom agencies have in common are huge waiting lists for new phone lines and outdated networks in desperate need of modernization.

Despite telecom horror stories in the Wild East, observers say the situation is slowly but surely improving. During the past three years, the telecommunications companies and international telecommunications companies have poured an enormous amount of money into the development of the region's phone infrastructure with some positive results.

Additionally, Western businesses setting up shop in Eastern Europe are finding ways to get around the feeble phone

VSAT dishes economical, analysts say.

"Most [Eastern European] offices of Western companies tend to be small and don't generate that much traffic," says Graham Wilde, managing director at London-based telecom research firm CIT Research Ltd. Currently, there are only about 1,000 VSAT dishes in operation throughout Eastern Europe, he says.

Some local financial institutions, such as the Czech Republic's Investbanka, have established their own X.25 networks to transmit and process branch transactions throughout the country.

Chemical giant BASF AG in Ludwigshafen, Germany, has also connected its facilities in Eastern Europe to facilities in other countries via X.25 data lines. Some of these offices, however, have no connectivity to local manufacturing sites or to the company's data processing centers in Germany. Data lines are often interrupted, and even the basic electricity supply occasionally goes down, company officials say. BASF says, however, that local telephone and data companies are constantly improving the infrastructure.

Electrical engineering group ABB Asea Brown Boveri Ltd. in Zurich has a very aggressive strategy to enter Eastern Europe, where ABB employs about 25,000 people. "It's a business challenge and an IS challenge to build up these companies," says Bengt Skantzke, chief of

Continued on page 46

**Setting up shop in Eastern Europe is no simple matter. With an infrastructure that is woefully behind the times, IS managers must be both creative and patient.**

Warsaw researchers at the Polish Agency Badan Marketingowych i Spolecznych (Social and Market Research Agency) have little trouble making international phone calls, but calling home a few blocks away is a hit or miss operation.

Comparing Eastern Europe's telecom communications infrastructure to Western Europe is like comparing a typewriter with a PC. As it stands today, one of the biggest concerns for global companies expanding into Eastern Europe is telecommunications. What Eastern Europe's state-owned

networks of the region. Satellite services, mobile phone networks and international private carriers are some of the workarounds that allow commerce to continue despite existing communications obstacles.

Deutsche Bank AG in Frankfurt, for example, sidesteps local telecom networks by transmitting data via satellite dishes to its data processing centers in Western Europe, company officials say.

But satellite services are not feasible for everyone. A firm must generate a certain amount of traffic to make two-way

**The telecom infrastructure in Prague, as in most Eastern European capitals, is woefully behind the large number of businesses awaiting dial tones.**



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# After the fall

**F**REEDOM WAS NOT THE ONLY THING Estonia inherited when it broke away from the former Soviet Union just four years ago. The small Baltic state, along with Latvia and Lithuania, inherited all the problems of a telecommunications infrastructure designed primarily to serve the phone tapping activities of the KGB, the intelligence agency for the former Soviet Union.

"I can't say that we have had serious problems that can't be solved, but in many cases it takes time — too much time," says Tina Meril, information technology manager at the Estonian Foreign Affairs Ministry. "The main problem for me now is that physical [wire] connections in the Baltic states could be better," says Meril, whose daily struggle is to connect Estonia's Foreign Ministry with its em-

bassies and consulates around the world.

All international calls from the Baltic countries had to be routed through Moscow, where the KGB's tapping devices were connected. Not only was the solution bad in terms of privacy, but the land-based cables had too little capacity, which produced poor quality communications.

When Lithuanian Prime Minister

didn't like the concept of talking on the phone while the KGB was listening.

What he got was a link that connected directly to the network of Norwegian state-owned carrier Telenor so international calls from Riga could be routed through Oslo.

Ironically, one of the main reasons the liberation process in the former Soviet Union was not squashed in its infancy was the KGB's lack of insight into modern telecommunications. The generals did not understand that the Internet reached far into the Russian academic world and that despite their efforts to block international phone lines, the global network enabled people to communicate with the outside world.

## With their freedom, the Baltic states inherited a telecom infrastructure designed to serve the KGB.

Vytautas Landsbergis led his people to independence, one of the first things he did was to mount a satellite dish atop the parliament building in Riga. Landsbergis

Estonia's 17 embassies in Europe and the U.S. use the Internet to keep in touch with their home country.

Though there are still fundamental



**Eastern European markets remain too fragile to encourage an increase in operations there. "It's a problem knowing what level of investment to make there."**

John Handley  
Glaxo PLC  
London

Continued from page 44

ABB's Global Information Services committee. "But it has come out pretty well. We invested in standard systems, and we helped them with people from the West to install and train." Skantze acknowledges that building up telecommunications was a problem because of the poor quality of the telephone networks. ABB has also resorted to satellite communications in several countries.

Fast food giant McDonald's Corp., meanwhile, is using BT's local access nodes in Eastern Europe to connect its branches in the East with its Central European headquarters in Vienna.

"Using BT's network is much more reliable. The quality is better, and it's cheaper" than what the Eastern European telecoms can offer, says Herbert Zocrenplanning, data processing manager at McDonald's Central Europe. The difficulty with using private carriers in Eastern Europe is that their network distribution tends to be limited, and local access nodes are not available everywhere, he says.

For Glaxo Holdings PLC in London, Eastern European markets remain too fragile to encourage an increase in its investments and operations there.

"It's a problem knowing what level of investment to make there," says John Handley, Glaxo's group information technology director.

Finding office space with phone lines already in-

stalled should be priority for any new business in Eastern Europe, says Adam Czarnecki, a researcher at the Agency Bada Marketingowych Spółdzielni w Warszawie, which recently completed a study of Poland's telecommunications markets. "Otherwise, you might wait forever" for new phones, he says.

In Poland, there are more than 2 million outstanding applications for new phone lines, and depending on their location, subscribers may have to wait several years for a dial tone. The situation in the Czech and Slovak Republics, Russia, the Commonwealth of Independent States and even Hungary, which has made the most progress in the region, is similar, long waiting lists with millions of applications.

**Cost the issue.** The International Telecommunications Union (ITU) estimates that telecom network development programs in Eastern Europe will require investments totaling \$94 billion over the next five years. And the ITU's figure may actually be too low if individual countries' current estimates are on target.

When US West, Inc., Deutsche Telekom AG and France Telecom agreed in October 1994 to jointly assist the Russian government in rebuilding the country's long-distance telephone network, the Russian government estimated that the project would require investments of up to \$40 billion.

Because improving Eastern Europe's telecom in-

## Emerging Markets



**Norsk Hydro's Svein Breivik:** "Today, every second person you meet [in Russia] seems to have a portable [computer] and a mobile phone."

problems with the domestic infrastructure, circumstances have changed radically. Several carriers, including Sprint Corp., have established beachheads in the Baltics. International calls are now routed through Helsinki or Stockholm instead of Moscow.

Russia's telecommunications infrastructure

is also undergoing radical change. Now, satellite and land-based links for international calls are in place in most areas, the next battleground will be the domestic network. But one of the main obstacles is the changing priorities of Russian politicians.

"Several politicians want to turn back

history and return to 'the good old days,'" says Svein Breivik, vice president for the Russian activities at oil company Norsk Hydro. "But I don't think it's possible. The changes have gone too far."

Just placing a telephone call to Breivik demonstrates how much things are changing. When you call Norsk Hydro's headquarters in Oslo, the operator says she'll connect you to Mr. Breivik. Moments later, the London/Oslo/Moscow line is established, and the conversation is carried across the oil company's internal network.

Norsk Hydro, which is trying to get a foothold in the lucrative oil fields south of the islands of Novaya Zemlya in the Arctic Ocean, has established an organization in Moscow comprising 35 people. Breivik says he has seen radical changes since he arrived two years ago. "When I attended meetings in the beginning, it was not uncommon to see people using slide rules. Today, every second person you meet seems to have a portable [computer] and a mobile phone."

BY WRITTEN BY PAUL LEBLANC, AN ICG NEWS SERVICE CONTRIBUTOR IN LONDON.

infrastructure is an integral part of the region's overall economic reform, almost all countries have by now launched extensive telecom modernization programs. The programs generally aim to increase line capacity and density, modernize infrastructure and improve services.

Regulatory changes have also been made in various countries, including Hungary and the Czech Republic, in an effort to attract foreign investors

still debating the fate of its telecom company.

Seeing huge growth potential in spite of the challenges, Western European and U.S. telecommunications companies have been snapping up investment opportunities in the former Soviet bloc countries.

Last year, the Magnum consortium of Deutsche Telekom in Bonn and Chicago-based Ameritech Corp. spent \$875 million for a 30% stake in Hungary's Magyar telecom company.

The Czech Republic's SPT Telecom is now in the midst of selecting a strategic international partner that will be allowed to purchase a 27% stake in the state-owned company up to 10 European and U.S. telecom companies have expressed interest in bidding at prices rumored to range between \$700 million and \$1 billion. Deutsche Telekom and Ameritech are among the potential bidders, as are Bell Atlantic Corp., France Telecom, Royal PTT Netherlands, Swiss Telecom and AT&T Corp.

BY WRITTEN BY PAUL LEBLANC, AN ICG NEWS SERVICE CONTRIBUTOR IN MOSCOW. GERMANY CONTRIBUTOR FOR ICG NEWS SERVICE CONTRIBUTOR IN LONDON.



In Poland, there are more than 2 million outstanding applications for new phone lines. Depending on their location, subscribers may have to wait several years for a dial tone.

## To establish footholds in Eastern Europe, Western businesses use satellites and global telecom carriers to get around nascent phone networks.

Measures include the partition of postal and telecom services; the separation of operating and regulatory functions; limitations on state control of telecoms; and the opening of local markets, mobile phone, satellite and value added services.

In other places, however, pledges of full deregulation and privatization remain promises without deadlines, as is the case with the Polish state-owned telecom company Telekomunikacja Polska SA in Warsaw. Likewise, the Slovak government is

# THE GIANT STIR<sup>★</sup>S

Gone are the  
banners and slogans.  
At last, China  
is entering the global  
economy.

## Emerging Markets

**T**HE SHANGHAI NO. 2 MACHINE TOOL WORKS factory, located on a nondescript street in the heart of the sprawling East China city for which it is named, stands as an austere testimony to the Chinese government's emphasis on strength through manufacturing. Gray, stark and forbidding, the exterior of the state-owned factory complex would make a fitting backdrop for a documentary on Chairman Mao's Great Leap Forward.

By Don Tennant

Yet venturing inside the complex, you clearly see that some remarkable changes are occurring in the People's Republic of China (PRC). It's not just the modern imported manufacturing equipment installed on the huge shop floor that bespeaks the changes. It is perhaps what you don't see that is most telling.

Gone are the ubiquitous red banners that for decades exhorted workers to toil for the glory of the Chinese Communist Party. Lou Xin, the plant's information systems manager, laughs at mention of the banners. "That was

in the past. Now we're concerned about business," he says.

A focus on business issues and openness to Western management has made China an attractive market for foreign investment. As the PRC's state-owned corporations evolve from centrally planned models of inefficiency to market-driven commercial enterprises, they are finding themselves competing against an influx of foreign firms eager to gain a share in China's huge consumer market.

While Chinese law now allows foreign firms to set up wholly owned sub-

sidaries on the mainland, these firms more commonly open representative or liaison offices that report to subsidiaries based elsewhere in Asia, often in Hong Kong or Singapore.

When a foreign firm does opt to set up manufacturing or other large-scale operations in the PRC, it typically teams with a Chinese partner to facilitate the mandatory relationship-building. This also helps it navigate around the obstacles inherent in the Chinese government bureaucracy.

Any foreign company that sets up

Continued on page 81



While the PRC is a big market, new firms should be wary. It's not all easy, however, for Western companies to do business in China.

Photo by [unreadable]

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## Emerging Markets

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operations in China will need to rely heavily on its IS department to tackle a host of challenges, a primary one being China's underdeveloped communications infrastructure.

Shanghai Johnson Ltd. is an 8-year old joint venture between S. C. Johnson & Son, Inc. — a Racine, Wis.-based consumer goods manufacturer best known for household products such as Raid insect killer and Pledge furniture polish — Shanghai Daily Chemical Industrial

Co., Ltd. — a Shanghai-based chemical company. "At our previous location, we used microwave to link to the nearest telephone office," Wang says. "But because of the tall buildings around here, we can't use microwave, so we had to order [a Digital Data Network] leased line," a process that routinely takes two months.

Lawrence Kwan, IS manager at Kodak (Far East) Ltd. in Hong

Kong, is exploring setting up a wide-area network to link Kodak's liaison offices in Beijing, Shanghai and Guangzhou with its China headquarters in Hong Kong and the Asia-Pacific regional office in Tokyo. While his effort is still at the planning stage, he's wary about his prospects for a straightforward implementation without having made the proper connections.

"What I've heard is, it's a bit difficult to get a private leased line in China. It really depends on the relationship your company has with the telecommunications authorities," Kwan says.

Even more difficult, in many cases, is getting a simple dial-up voice line installed. While the Chinese government has signed hundreds of millions of dollars' worth of telephone-related contracts in the past two years with the likes of AT&T, Northern Telecom Ltd., France's

### A focus on business issues and openness to Western management has made China an attractive market for foreign investment

Alcatel Alsthom SA and Sweden's Telefon AB LM Ericsson, observers warn that it will be years before China is on par with Western countries. Even in large cities such as Shanghai and Beijing, getting a single telephone line installed is a three-month affair.

"Though communications have vastly improved in the last decade, it is still a problem," says Ronald Yu, chairman of the Information Technology Committee of the American Chamber of Commerce in Hong Kong. "The communications links are something that IS managers need to consider quite carefully because they may not be as fast or as stable as people expect."

Looking support. Telecommunications inadequacy aside, IS managers who enter China will find there is little lacking in

Development Corp. While Shanghai Johnson is an old-timer by Sino-American joint venture standards, communications hurdles still confront IS manager Kirk Wang.

When Shanghai Johnson moved to a new location in Shanghai last November, the dedicated communications link to the company's Wisconsin headquarters was down for two months while the company waited for a leased line. This made for some unhappy employees.

"Foreign employees have a lot of experience with E-mail systems, and in China they are looking for the same service," Wang says, explaining one facet of the company's requirement for a 64K bit/sec leased line to the U.S. Getting the over-

seas line was no problem, the Shanghai Posts and Telecommunications authority provides AT&T Corp.'s Skynet Internet Business Service for commercial users. The difficulty lay in getting the connection to the local telephone office so Shanghai Johnson could access the Skynet uplink.

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Alcatel Alsthom SA and Sweden's Telefon AB LM Ericsson, observers warn that it will be years before China is on par with Western countries. Even in large cities such as Shanghai and Beijing, getting a single telephone line installed is a three-month affair.

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Beijing by Switzerland's Schindler Holding, the PRC's China Construction Machinery Corp. and Hong Kong based Jardine Schindler (Far East) Ltd. — the support issue is not so much availability but cost, which in China Schindler's case is prohibitive.

China Schindler has successfully implemented BPCS, a manufacturing resource planning (MRP) II package from Chicago-based System Software Associates, Inc. Li Wen Hua, China Schindler's computer center chief, extols the improvements in accounting accuracy and manufacturing efficiency that his firm has enjoyed since the plant's implementation of BPCS began in 1992.

### For China-bound IS operations, personnel is bound to be the biggest headache.

However, Li adds that his company and many others in China are not in a position to maintain that level of efficiency at any one. "SSA's support fees are too high," he says. "If it rests on these high fees, SSA will lose some part of the market."

China Schindler's director for enterprise management, Ge Man Zeng, says, "MRP II itself has its imperfections, so an outlay of \$800 per day for a support consultant is not cost-effective."

Support issues have played a key role in prompting foreign firms to base their IS operations off the mainland, where support is typically less accessible and manageable.

Monsanto Far East Ltd., for example, a subsidiary of the U.S. chemical giant, has sited its China hub in Hong Kong. "There is a lot of technical expertise in Hong Kong, and we have more sourcing and support options than we would have in China," says Matthew Kwok, Monsanto Far East's IS manager.

Still, the biggest headache for a China-bound IS operation is likely to be personnel finding, allocating and keeping staffers.

"The issue of remuneration inflation is a fairly serious one in China," says the American Chamber of Commerce's Yu. "Because a lot of companies are coming to China, they are willing to bid for employees. The biggest problem Western companies will have is that their wage scales will not be able to handle this kind of [wage] inflation."

Shanghai Johnson's Wang agrees. "Now in the China market, finance and IS people are rare and are in high demand. Qualified people can find good positions easily," he says.

As a result, there is high turnover among experienced staffers, especially from state enterprises, whose budgets do not approach those of foreign firms and joint-venture companies.

Shanghai No. 2 Machine Tool Works' Xun, for example, has spent scarce resources training more than one IS specialist, only to see them defect to joint ventures. The problem may well prompt the Chinese government to crack down on job-hopping state employees.

BY THOMAS J. BEECHER IN CHARGE OF COMPUTERS/BEIJING, CHINA

## An Elixir for India

**T**he 1990s have seen a major transformation in the maturity level of Indian end-user organizations, but content with the rudimentary applications they had in the 1980s, users today demand information technology that meets them in the bottom line. This translates into a groundswell of support for open systems.

"It is now our policy to support only open systems," declares K. L. Mehta, general manager of management systems at Hindustan Petroleum Corp. Ltd., a petroleum refiner and marketer based in Bombay.

Others agree. "We have decided to support open systems for a number of reasons. It gives you cost advantages and hardware independence. There is higher reliability and ease of implementation," says Ravindra Datta, manager of Citibank Corp.'s Global Consumer Division in India.

Due in part to the opening of the Indian economy to foreign competitors, total quality management, ISO 9000 standards and corporate restructuring are also taking hold. Information systems, the re-engineering enabler, is seen as the elixir.

"TQM departments, which were traditionally used as information systems for managers, have slowly begun to evolve as driving forces of business process re-engineering," says W. S. Datta, a consultant at A. E. Ferguson & Co., a leading Indian information technology consulting firm.

This is underlined at Tata Engineering and Locomotion Co. Ltd. (TEL), a Bombay-based maker of commercial vehicles, passenger cars and spares with plants in Pune, Bangalore and Jaipur. "Information technology has to graduate from passive information support to actively driving the user's business process re-engineering and help them manage their tasks effectively," says S. S. Pradhan, general manager for management systems at TEL.

Information technology must reduce product development cycle time, reduce manufacturing cycle time, cut costs and improve profitability for any company to remain internationally competitive, Pradhan says.



In this case, TEL has spent more than \$25 million on IT in the past two years to computerize everything from design to delivery, Pradhan adds. The company uses a network of IBM RS/6000 R34 parallel servers and Wilson Graphics, Inc. Power Challenge 486-based workstations. PCs are connected on a fiber distributed data interface and Ethernet LAN. TEL designs its vehicles using computer-aided design and manufacturing and design automation tools. Research engineering is being limited to two phases, in phase one, users are concentrating design, planning and vendor development. In phase two, users are using an object-oriented product manager to automate product development coordination. — Written by Vance Cleveland in New Delhi



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# The Global

IN THE PREMIER ISSUE OF *The Global 100*, *Computerworld's* objective was to present a list — not a ranking — of 100 outstanding users of information technology from around the world. Besides naming outstanding companies, *Computerworld* wanted the list to reflect leading information technology users in diverse industries and countries from all regions of the globe. The result is an eclectic combination of organizations from 31 countries: Some are globally integrated corporations, some are international or national leaders, and some are government agencies. All have passed muster based on a combination of qualitative and quantitative analysis.

<b>ABB Asea Brown Boveri Ltd.</b>	Industrial Equipment. Specializes in power generation and transmission systems, power distribution and control, industrial products, systems and services.	Switzerland	\$28,000
<b>AGFA Gevaert NV<sup>1</sup></b>	Equipment and Electronics/Photolithographic Equipment. Manufactures photographic equipment and printing supplies.	Belgium	\$7,000
<b>AND Corp.</b>	Transportation. Provides airline passenger and cargo carrier services.	USA	\$18,000
<b>Aerospaciale<sup>2</sup></b>	Transportation. Provides the Airbus planes and participates in the Airbus projects in space domain.	France	\$6,300
<b>Amulins<sup>3</sup></b>	Transportation. Global travel company with computerized distribution and reservation system.	France	\$100
<b>Arab National Bank</b>	Banking. 100 branch points corporate, private and investment banking.	Saudi Arabia	\$507
<b>Avatix AG</b>	Equipment and Electronics/Photolithographic Equipment. Manufactures large lithograph equipment.	Turkey	\$1,370
<b>Australia and New Zealand Banking Group</b>	Banking. Provides full banking and financial services for Australia, New Zealand and 10 countries worldwide.	Australia	\$5,170
<b>BMW</b>	Automobiles. Manufactures and distributes luxury automobiles and motorcycle worldwide.	Germany	\$46,700
<b>Banco Androsiano Veneto S.p.A.</b>	Banking. Provides banking facilities, leasing, property management, insurance brokerage, investment banking and other financial services.	Italy	NA
<b>Banco Bradesco SA</b>	Banking. The largest private bank in Brazil.	Brazil	\$15,300
<b>Banco Exterior de España</b>	Banking. Specializes in commercial, corporate and international banking, investment and financial services.	Spain	\$3,757

1) 1990. 2) 1991. 3) 1992. 4) 1993. 5) 1994. 6) 1995. 7) 1996. 8) 1997. 9) 1998. 10) 1999. 11) 2000. 12) 2001. 13) 2002. 14) 2003. 15) 2004. 16) 2005. 17) 2006. 18) 2007. 19) 2008. 20) 2009. 21) 2010. 22) 2011. 23) 2012. 24) 2013. 25) 2014. 26) 2015. 27) 2016. 28) 2017. 29) 2018. 30) 2019. 31) 2020.

## The Global 100

THERE IS NO DEFINITIVE QUANTITATIVE measure that captures what it means to be an "outstanding" user of information technology. Information technology and information systems productivity comes close. However, to collect consistent data using highly refined definitions is virtually impossible when canvassing the globe. No two countries report financial data in the same way.

Computerworld, instead, took the qualitative route. For one thing, a qualitative evaluation is doable. For another, it can capture the essence of "outstanding."

Late last year, Computerworld asked information technology experts from around the world to nominate companies, nonprofit organizations and government agencies that they believe demonstrate excellence in the

use of information technology.

The nominators included computer vendors, management and information technology consultants and International Data Group (IDG) publications from around the world (see the Global 100 Nominating Committee, page 2).

Companies had to hold a "leadership position" in at least one of three categories: a functional category, such as manufacturing or logistics; a key technology, such as networking or client/server; or management, such as business process reengineering or management of dispersed groups or divisions. Companies whose primary business is



computer hardware or software or telecommunications equipment were excluded.

From the 500 plus nominations they received from 40 countries in January, Computerworld researchers gathered financial and IS data about each company from public sources, from the nominated companies and from IDG publica-

tions around the world.

The final Global 100 listing was selected by Computerworld's Special Projects Team based on research and analysis of available data on organization size, industry position, geographic location, country leadership in IS and the use of information technology.

## Faces

The people behind the organizations



Frank W. Nyström  
ABB, Sweden

IT IS 10-100-100 corporate vice president of group information systems endorsement the belief that technology is needed to create a powerful company. He claims that there is no place here for stability when it comes to new applications and systems. "ABB is a company that makes aggressive use of modern technology." Frank W. Nyström says. Technology awareness is crucial for a company to perform at its best, he says.

IMPLEMENTING THE LATEST technology keeps the Arab National Bank's IS manager more than busy. "We are working toward being at the forefront of technology using information engineering to automate processes that will provide quality and timely delivery systems," 46-year-old Mohammed I. Al Mansour says. But the customer is never forgotten in this pursuit of technology. "Our ultimate objective is to be a quality and responsive organization that will contribute to the financial stability of the community and the economy."



Mohammed I.  
Al Mansour  
Arab National Bank,  
Saudi Arabia

|         |                 |              |
|---------|-----------------|--------------|
| \$2,300 | 1,000           | \$700        |
| \$5     | 200             | \$30         |
| -\$10   | More than 5,000 | \$200-\$400  |
| -\$25   | 500-900         | \$350-\$400  |
| \$4     | 500-900         | \$50-\$100   |
| \$100   | 100             | \$20         |
| \$102   | 240             | \$80         |
| \$105   | 100-240         | \$100-\$240* |
| \$207   | 1,000           | \$200        |
| \$103   | 470             | \$90         |
| \$50    | 2,500           | \$100        |
| \$228   | NA              | NA           |

# The Global 100

|                                                       |                                                                                                                                                             |                             |                 |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------|
| <b>BankEast<sup>1</sup></b>                           | Banking, limited liability commercial bank licensed to retail banking, corporate banking, investment banking and international services                     | <b>Indonesia</b>            | <b>\$680</b>    |
| <b>Barclays Bank PLC<sup>1</sup></b>                  | Banking, one of the largest financial services organizations in the UK, operating in 78 countries                                                           | <b>UK</b>                   | <b>\$11,000</b> |
| <b>Beca PLC</b>                                       | Food & Beverage, Brown and carbonate flow beverages to worldwide customers                                                                                  | <b>UK</b>                   | <b>\$7,004</b>  |
| <b>British Petroleum Co. PLC</b>                      | Oil & Gas, the main oil production operations in Britain and North Sea with exploration worldwide; markets through international service stations           | <b>UK</b>                   | <b>\$52,425</b> |
| <b>The Broken Hill Proprietary Co. Ltd.</b>           | Metals, Australia's largest steel producer and national resources company                                                                                   | <b>Australia</b>            | <b>\$12,238</b> |
| <b>CIP Assurances SA<sup>1</sup></b>                  | Insurance, Government-owned personal insurance in France specializes in life insurance, annuity and capitalization                                          | <b>France</b>               | <b>\$14,100</b> |
| <b>COOCELCO Chile-Orleno Chongolomela<sup>1</sup></b> | Metals, World's largest copper producer producing mainly electrolytic copper and sulphur                                                                    | <b>Chile</b>                | <b>\$1,081</b>  |
| <b>CSA Corp.<sup>1</sup></b>                          | Transportation, Federal transportation agency freight car fleet and maintenance repair shops as well as international transportation companies              | <b>USA</b>                  | <b>\$9,569</b>  |
| <b>Canex SA</b>                                       | Mining and Other Process Manufacturing, fourth-largest cement producer in the world and the largest in Latin America                                        | <b>Mexico</b>               | <b>\$2,076</b>  |
| <b>The Charles Schwab Corp.<sup>1</sup></b>           | Financial Services, holding company with subsidiaries that provide discount brokerage services                                                              | <b>USA</b>                  | <b>\$1,000</b>  |
| <b>The Chase Manhattan Corp.<sup>1</sup></b>          | Banking, financial holding company with subsidiaries in ordinary services, credit-card services and commercial, mortgage and investment banking             | <b>USA</b>                  | <b>\$11,067</b> |
| <b>Chicago Mercantile Exchange<sup>1</sup></b>        | Financial Services, provides trading services for futures commodity exchange                                                                                | <b>USA</b>                  | <b>\$145</b>    |
| <b>The Coca-Cola Co.</b>                              | Food & Beverage, manufacturers, markets and distributes soft drink and juice products                                                                       | <b>USA</b>                  | <b>\$13,067</b> |
| <b>Colex Myer Ltd.<sup>1</sup></b>                    | Retail, largest retailer in Australia operates department and department, discount and specialty stores                                                     | <b>Australia</b>            | <b>\$11,000</b> |
| <b>The Dai-ichi Kangyo Bank Ltd.<sup>1</sup></b>      | Banking, Japan's largest financial institution in the world in assets and deposits                                                                          | <b>Japan</b>                | <b>\$12,770</b> |
| <b>Deutsche Bank AG</b>                               | Banking, Germany's largest financial institution licensed as retail, private and corporate banking, financial services, trading and foreign exchange        | <b>Germany</b>              | <b>NA</b>       |
| <b>Deutsche Bundespost Telekom</b>                    | Telecommunications, provides long-distance and nationwide of the German telecommunications network, local telephony, directory assistance, radio mail, etc. | <b>Germany</b>              | <b>\$28,311</b> |
| <b>Deutsche Lufthansa AG</b>                          | Transportation, Germany's national airline with worldwide network providing flights to all continents                                                       | <b>Germany</b>              | <b>\$10,103</b> |
| <b>ENEL S.p.A.</b>                                    | Utilities, produces and distributes power generating and transmitting systems worldwide                                                                     | <b>Italy</b>                | <b>\$21,004</b> |
| <b>ES Lilly and Co.</b>                               | Pharmaceuticals, pharmaceutical company focuses on antibiotics, insulin, Prozac and medical devices                                                         | <b>USA</b>                  | <b>\$4,452</b>  |
| <b>Executive Airlines</b>                             | Transportation, international carrier of the United Arab Emirates serves 24 destinations in 27 countries                                                    | <b>United Arab Emirates</b> | <b>\$945</b>    |
| <b>Fiat S.p.A.</b>                                    | Automotive, manufactures and sells automobiles, commercial vehicles and agricultural and construction equipment                                             | <b>Italy</b>                | <b>\$11,000</b> |

All other figures are for most recent fiscal year available. <sup>1</sup>1991 fiscal year. <sup>2</sup>1990 fiscal year. <sup>3</sup>1989 fiscal year. <sup>4</sup>1988 fiscal year. <sup>5</sup>1987 fiscal year.

## Faces

**A** DIVISION HEAD of the System and Technology Division at EastCote, Inge Scottjato, 55, is responsible for the operation of five departments. To make the best use of each department's strengths, she encourages flexibility and joint projects. A rigid structure would isolate the departments and undermine the goal of the organization, she says. Because her mission is to be at the forefront of leading technology, Scottjato knows that her division must always be looking to use any technology.



**Inge Scottjato**  
EastCote, Indonesia



**Oscar A. Letelier**  
Leticier, Chile

**M**ORE THAN 1,000 employees report to this vice president for management of IS functions. His recent re-engineering project in Chilean Codeco's productivity while reducing its costs. Attempts to create a more effective organization have succeeded, and now, more management and truck routing are available on line. And Oscar A.

Letelier, 46, does not plan to stop there — he's always looking for ways to strengthen the company through IS.

## DON'T HAVE THE BOSS'S EAR?

You're not alone. Only one-third of CIOs report directly to the CEO, according to a survey of 100 companies nominated to the Global 100.



**Hugh R. Pride**  
Emirates Airlines, UAE

**S**HORTCUTS ARE NOT Hugh R. Pride's style. The 50-year-old general manager of information technology at Emirates Airlines acknowledges that "moving to client/server has not been without pain." But his No. 1 priority is the airline's efficiency, so he refuses to sacrifice performance. Pride says he believes the move to client/server helps secure Emirates a place in the competitive airline industry. "We intend to use information technology to maintain our leadership position," he says.

| Salary  | By company    | By company        |
|---------|---------------|-------------------|
| \$75    | 130           | \$10              |
| \$3,000 | 2,500-4,000   | More than \$1,000 |
| \$500   | 500-500       | \$100-\$240       |
| \$1,345 | 1,000-2,400   | \$500-\$1,000     |
| \$946   | 1,000-2,400   | \$100-\$240       |
| \$236   | 227           | \$10              |
| \$406   | Less than 100 | \$5-\$50          |
| \$663   | 1,500         | \$100             |
| \$607   | 100-240       | \$25-\$40         |
| \$105   | 500-500       | \$100-\$240       |
| \$1,306 | 2,500         | \$100             |
| \$20    | 575           | \$34              |
| \$2,376 | 100-240       | \$100-\$240       |
| \$253   | 1,000         | \$100             |
| \$107   | 500-500       | NA                |
| \$3     | 2,000         | \$575             |
| \$1,604 | 2,500-4,000   | \$100-\$1,000     |
| \$6,606 | 1,000-2,400   | NA                |
| NA      | 1,300         | \$237             |
| \$480   | 2,500-4,000   | \$250-\$450       |
| \$66    | 575           | \$30              |
| -\$1    | 1,000-2,400   | \$30              |

# The Global 100

| Company                                                     | Company Description                                                                                                                                                       | Country      | Revenue<br>\$ in millions |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------------|
| Fidelity Investments <sup>1</sup>                           | Financial Services. Provides services including mutual funds, brokerage, insurance and retirement plans                                                                   | USA          | \$2,880                   |
| First National Bank Holdings Ltd. <sup>1</sup>              | Banking. Holding company with subsidiaries operating in commercial banking                                                                                                | South Africa | NA                        |
| Fisher and Paykel Ltd.                                      | Appliances and Electronics/Refrigerators/Photographic Equipment. Manufactures refrigerators, freezers, washing machines, dishwashers, electric ranges, etc.               | New Zealand  | \$420                     |
| Ford Motor Co.                                              | Automobiles. Manufactures, sells and leases cars, trucks and related parts in vehicles                                                                                    | USA          | \$168,521                 |
| Glaxo Holdings PLC <sup>1</sup>                             | Pharmaceuticals. Researches, develops, manufactures and markets prescription and over-the-counter                                                                         | UK           | \$8,882                   |
| Groupama <sup>1</sup>                                       | Banking. Finance and investment company provides commercial, investment and financial services as well as investment portfolio operations                                 | France       | \$5,780                   |
| Hindustan Lever Ltd.                                        | Consumer Products & Apparel. Produces detergents, personal products, chemicals, toiletries and soft products                                                              | India        | \$800                     |
| Hyundai Corp. <sup>1</sup>                                  | Automobiles. Largest car manufacturer in South Korea                                                                                                                      | South Korea  | \$11,300                  |
| ITT Hartford                                                | Insurance. Holding company with subsidiaries that underwrite and sell property-casualty, personal auto/health, home owners, life and health insurance plans               | USA          | \$16,686                  |
| Information and Decision Support Center <sup>2</sup>        | Government. Created and now manages the Egyptian government's information technology and decision support infrastructure, providing an industrial base for the country    | Egypt        | \$14                      |
| Japan Finance Corporation for Small Business <sup>1,2</sup> | Government. Independent agency supports economic development by providing long-term financing and information to Japan's small and medium businesses                      | Japan        | \$27                      |
| Junco Co. Ltd.                                              | Textile. Sells products including clothing, food, household goods, electric appliances, furniture, cosmetics, tobacco, firearms and pharmaceuticals                       | Japan        | \$14,418                  |
| Kao Corp. <sup>1</sup>                                      | Consumer Products & Apparel. Manufactures consumer products, fully chemicals and information technology products including floppy disks                                   | Japan        | \$2,368                   |
| Kvaerner Engineering AS                                     | Industrial Equipment. Builds ships, operates oilfields and provides engineering and consulting services for 50 of 60 oil and gas industry                                 | Norway       | \$3,263                   |
| The Naveglio Bank Ltd.                                      | Banking. Provides commercial banking and loans for retail and business customers, banking and exchange of currencies                                                      | South Korea  | NA                        |
| NCC Communications Corp. <sup>2</sup>                       | Communications. Provides long-distance telephone, fax and data/cable services                                                                                             | USA          | \$12,300                  |
| Merrill Lynch & Co., Inc.                                   | Financial Services. Holding company with subsidiaries providing brokerage, investment, banking and small business, asset management, insurance, debt and equity offerings | USA          | \$18,588                  |
| Metropolitan Toronto Police <sup>1,2</sup>                  | Government. One of the largest municipal agencies in North America; serves all other adjoining towns                                                                      | Canada       | \$217                     |
| Michigan Department of Social Services <sup>1,2</sup>       | Government. Manages eligibility determinations and benefit authorizations for publicly funded programs; provides protection, protection and self-sufficiency services     | USA          | \$2,818                   |
| Mitsui Corp. <sup>1</sup>                                   | Industrial Equipment. Cutting-based supplier of machinery, industrial equipment                                                                                           | Japan        | \$180                     |
| NEC Ltd.                                                    | Industrial Equipment. Global manufacturer of laptops, electronic components and provides mobile parts                                                                     | Japan        | \$6,357                   |
| National Computer Board <sup>2</sup>                        | Government. Statutory board under Singapore's Ministry of Finance that develops information technology in Singapore                                                       | Singapore    | \$26                      |

All dollar figures are for most recent fiscal year available. <sup>1</sup>1993 fiscal year. <sup>2</sup>1992 fiscal year. <sup>3</sup>1991 fiscal year. <sup>4</sup>1990 fiscal year. <sup>5</sup>1989 fiscal year.

| Profit<br>(\$ in millions) | # employees   | R&D spending<br>(\$ in millions) |
|----------------------------|---------------|----------------------------------|
| NA                         | 1,000-2,499   | \$250-\$499                      |
| \$276                      | 1,000-2,499   | \$63                             |
| NA                         | 70            | NA                               |
| \$2,529                    | 2,500-4,999   | \$250-\$499                      |
| \$2,000                    | NA            | NA                               |
| \$580                      | 1,000-2,499   | \$350-\$499                      |
| \$74                       | Less than 500 | \$5-\$9                          |
| \$181                      | 100-249       | \$50-\$99                        |
| \$400                      | 1,000-2,499   | \$700-\$949                      |
| \$0                        | 32            | \$11                             |
| \$0                        | Less than 500 | \$1-\$4                          |
| \$74                       | NA            | NA                               |
| \$215                      | NA            | \$125                            |
| \$130                      | 250-499       | \$50-\$99                        |
| NA                         | 81            | \$0                              |
| \$716                      | 2,500-4,999   | \$500-\$1,000                    |
| \$1,300                    | 2,500-4,999   | \$600-\$1,000                    |
| \$0                        | 165           | \$17                             |
| \$0                        | 250-499       | \$50-\$99                        |
| NA                         | 11            | NA                               |
| \$25                       | 100-249       | \$25-\$49                        |
| \$0                        | 1,000-2,499   | \$25-\$49                        |

## Faces



**Bruce Goldwell**  
Fisher and Paykel Ltd.  
New Zealand

**A** MAJOR RESTRUCTURING was enacted at Fisher and Paykel, due to harsh economic conditions in the late 1980s, as Bruce Goldwell, group manager of R&D, and his department chose a central source of information and created a shared database structure. Goldwell calls this structure a "common scoreboard." Information technology is not limited to in-house operations; the advanced technology benefits customers as well. Appliances contain computer systems that provide graphical presentational tasks and information.

**Brazil** represents the largest market for information technology in Latin America, according to IDC. The country accounted for

# 41%

of the entire IT spending in the region in 1993.

**I**T HAS TO BE A CEO today who "didn't understand the power of information technology," says 27-year IS veteran Ringer Mahabir. So would his boss. In the past two years, the director of computing and telecommunications has helped save the fourth largest police force in North America \$21 million. But Mahabir's interests go beyond money. At 41, he is the founding director and chief executive officer of Alternative Computer Training for the Disabled. "Partnerships make people successful. No one individual can be successful," he says.



**Ringer Mahabir**  
Alternative Computer  
Training

## Who says

the Japanese are technology laggards? Nippon Telegraph and Telephone is one of three Global 100 companies in the IT billion-dollar club.



# The Global 100

## National Information Centre<sup>1,2</sup>

## New Zealand Inland Revenue Department<sup>1,2</sup>

## Nhs, Inc.<sup>1</sup>

## Nippon Telegraph and Telephone Corp.

## The Nomura Securities Co. Ltd.<sup>1</sup>

## PECO Energy Co.<sup>1</sup>

## Petrobras Braskema SA-PETROBRAS

## Phillips Petroleum Co.<sup>1</sup>

## Pohang Iron and Steel Co. Ltd.

## Privatbank, Commercial Bank<sup>1</sup>

## Qantas Airways Ltd.<sup>1</sup>

## Rohs Royce PLC

## Royal Dutch PET Refineries N.V.<sup>1</sup>

## The Royal Hong Kong Jockey Club<sup>1</sup>

## Ryder Systems, Inc.

## Scotiabank AB

## Samsung Electronics Co. Ltd.

## Scandinavian Airlines System<sup>1</sup>

## Selge Ltd.

## Soviet Argentine SA

## Soviet Union Japan Co. Ltd.<sup>1</sup>

## Singapore Network Services

Government. Largest VHS network in India, uses satellite communication for exchange of information

Government. Collects revenue for government banking

Consumer Products & Apparel. Designs and manufactures athletic footwear, sports wear, bags and accessories

Communications. Provides services including cable and satellite communications, digital data exchange, printed paper, videotex, fax, networking and videomultimedia

Financial Services. Japan's largest securities house, with 100 domestic offices and 10 overseas offices

Utilities. Provides electric and natural gas services

Oil & Gas. State-controlled company explores, refines, produces and sells petroleum in Brazil and overseas

Oil & Gas. Explores and produces crude oil, natural gas liquids and natural gas

Metals. Manufactures and sells bar-rolled and coil-rolled steel products, plates, wire rods, alloys steel sheets and stainless steel products

Banking. Full banking services operations in clearing operations, retail banking and trade finance

Transportation. Australia's major international airline

Transportation. British leader in cars, motor and industrial gas turbines, power generators, nuclear engineering and materials handling

Communications. Provides worldwide printed and telecommunications services to institutions and private customers

International Services. Race racing, betting and membership services, operates the lottery as a nonprofit organization, giving surplus to charities

Transportation. Full-service banking including short-term credit of travelers, bankers and traders and related services

Automotive. Brakes, manifolds and complete brake lines, shaft and military aircraft, cars, vehicles and utilities

Apparel and Electronics. Watch/Watch/Photographic Equipment. Products 170, 175, meeting equipment and electronic items

Transportation. Airline services represents Denmark, Norway and Sweden, operates its own hotel chain and offers vacation tour packages

Retail. Retail stores and services chain operates with subsidiaries throughout the world

Automotive. Products, sales and exports cars, trucks and spare parts

Retail. Japan's leading convenience retailer operates in consumer goods

Communications. One of the world's first satellite broadcast data interchange network called Prodigy, selling more than 10 government agencies throughout Singapore

India

New Zealand

USA

Japan

Japan

USA

Brazil

USA

South Korea

Ukraine

Australia

UK

Netherlands

Hong Kong

USA

Sweden

South Korea

Sweden

Japan

Argentina

Japan

Singapore

\$10

\$375

\$2,700

\$64,500

\$6,500

\$4,000

\$10,029

\$12,400

\$8,000

\$104

\$4,000

\$1,200

\$6,000

\$8,700

\$4,217

\$13,210

\$10,000

\$4,000

\$10,200

\$1,000

\$1,001

\$10



| IT spending<br>(\$ in millions) | IT employees    | IT spending<br>(\$ in millions) |
|---------------------------------|-----------------|---------------------------------|
| \$0                             | 2,500-4,999     | \$25-\$49                       |
| \$0                             | 343             | \$01                            |
| \$200                           | 750-499         | \$10-\$24                       |
| \$404                           | More than 5,000 | More than \$1,000               |
| \$408                           | Less than 100   | NA                              |
| \$1,000                         | 715             | \$10                            |
| \$670                           | 1,000-2,499     | \$100-\$249                     |
| \$404                           | 500-999         | \$100-\$249                     |
| \$606                           | 1,000-2,499     | \$50-\$99                       |
| \$16                            | 48              | \$1                             |
| \$16                            | 500-999         | \$100-\$249                     |
| \$114                           | 500-999         | \$100-\$249                     |
| \$1,000                         | 2,500-4,999     | \$250-\$499                     |
| \$227                           | 250-499         | \$50-\$99                       |
| \$41                            | 500-999         | \$100-\$249                     |
| \$108                           | 250-499         | NA                              |
| \$467                           | More than 5,000 | More than \$1,000               |
| \$202                           | 1,000           | \$50                            |
| \$68                            | Less than 100   | \$50-\$99                       |
| \$84                            | NA              | \$100-\$249                     |
| \$448                           | Less than 100   | \$50-\$99                       |
| \$2                             | 100-249         | \$5-\$9                         |

## Faces

**A**mong the LARGEST employers in Japan,

Nippon Telegraph and Telephone Corp. needs a strong information systems department to keep it on track. At age 56, under association of IS Specialist Shimazaki knows how to run a structured organization. He stresses the importance of planning, and he labels high achievements in this area as part of Nippon Telegraph and Telephone's company values.

Employees are wise to share their innovative ideas because Shimazaki says he believes in "free creativity, high ideals and daring actions."



Ryusuke Shimazaki  
Nippon Telegraph and  
Telephone Corp., Japan



**F**ORD may be the largest automaker on the list, but VOLVO and FORD tied in total IT spending at \$375 million. Per employee, VOLVO spent more than \$5,000, while FORD spent about \$1,200.

**H**E MAY BE ONLY 33, but Alexander Doubilet is playing in the big leagues. He manages the operations of Privatbank's international division and bank activity

automation as first deputy chairman of the bank board. Privatbank's automation required it to develop several programs. "Bank Operation Day" is one example. Doubilet gets kudos from his peers for his use of available technology. Such recognition should continue as the young man has set ambitious information technology objectives for his bank.



Alexander Doubilet  
Privatbank, Ukraine

**U**SING HIS EXPERIENCE of business/information systems relationships, gleaned from when she ran her own consulting firm, 47-year-old IS staff manager Margitta Strömberg is building a new IS organization at Saatchi. She knows the IS department must never lose sight of the company's objectives, so she plans to develop a system that views the two as interdependent. "Our strength lies in our ability to vary and integrate our systems so that they all work together in a fully compatible global network," Strömberg says.



Margitta Strömberg  
Saatchi, Sweden

| Company                                                            | Industry Description                                                                                                                                    | Country     | 1990 Sales (\$ mil.) |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------|
| Alfa Romeo Automobiles AS                                          | Automotive. Majority owned by Volkswagen AG in Germany. It is the automotive division of a large industrial conglomerate.                               | Switzerland | \$1,351              |
| Sanmar Group                                                       | Building. One of Japan's largest and oldest industrial groups, centered around Sumitomo Bank and Sanmaru Corp.                                          | Japan       | \$165,951            |
| Deleair                                                            | Transportation. International offices with extensive global air network system.                                                                         | Switzerland | \$4,388              |
| Tata Engineering & Locomotive Co. Ltd.                             | Automotive. Produces commercial vehicles and passenger cars and provides services, repairs and spare parts.                                             | India       | \$1,700              |
| The Tata Iron & Steel Co. Ltd. <sup>1</sup>                        | Steel. Bhamburda finished steel, unfinished steel, rolled steel tubes and castings etc.                                                                 | India       | \$1,128              |
| Telecom Australia                                                  | Communications. Australia's dominant telecommunications carrier.                                                                                        | Australia   | \$5,586              |
| Telecom Italia S.p.A. <sup>1</sup>                                 | Communications. Provides worldwide telecommunications services using satellite systems, radio stations, telephone installations and dedicated networks. | Italy       | \$18,686             |
| Tokyo Electric Power Co., Inc.                                     | Utilities. Japan's largest electric power supplier in the Kanto region for commercial and industrial use.                                               | Japan       | \$47,338             |
| Toronto Stock Exchange <sup>1,2</sup>                              | Financial Services. Institution trading of secondary market equities and options.                                                                       | Canada      | \$55                 |
| Toyota Motor Corp.                                                 | Automotive. One of the world's largest automakers operates factories worldwide.                                                                         | Japan       | \$34,633             |
| TransCanada Pipelines Ltd.                                         | Oil & Gas. Pipeline for transportation of natural gas with natural gas.                                                                                 | Canada      | \$3,295              |
| United Health Care Corp. <sup>1</sup>                              | Insurance. Managed health care insurance business.                                                                                                      | USA         | \$3,769              |
| United Parcel Service, Inc.                                        | Transportation. World's largest package delivery company provides international service to more than 190 countries.                                     | USA         | \$68,888             |
| VANG Brazilian Airlines SA                                         | Transportation. Air mail and transport services for both domestic and international.                                                                    | Brazil      | \$2,035              |
| Vale Do Rio Doce, Companhia <sup>1</sup>                           | Mining and Other Processes. Bauxite/mineral. World's largest bauxite ore producer and exporter.                                                         | Brazil      | \$2,298              |
| Vehco AB                                                           | Automotive. Buses/trucks cars, trucks, buses, construction equipment, marine and industrial engines, aircraft and space engines and components.         | Sweden      | \$14,252             |
| Wab-Mert Stores, Inc. <sup>1</sup>                                 | Retail. Discount-multipurpose discount stores provide a wide selection of products at low prices.                                                       | USA         | \$67,845             |
| Washington State Department of Information Services <sup>1,2</sup> | Government. Provides telecommunications services and technology oversight for state agencies and local governments.                                     | USA         | \$80                 |
| Wells Fargo & Co.                                                  | Banking. Banking company with subsidiaries that provide commercial banking, investment banking, international and wealth-care services.                 | USA         | \$4,854              |
| Weyerhaeuser Co. <sup>1</sup>                                      | Mining and Other Processes. Bauxite/mineral. Private owner of aluminum bauxite and one of the largest forest products companies worldwide.              | USA         | \$18,236             |
| Wissenschaftliche Versuchsanstalten                                | Insurance. Offers insurance coverage worldwide for motor vehicles, public liability, general accidents, property, fire and theft.                       | Switzerland | \$12,818             |
| Xerox Corp.                                                        | Equipment and Electronics. Xerox/Sharp/Photocopy Equipment. Document processing and related products.                                                   | USA         | \$17,418             |

1. Dollar figures are for most recent fiscal year available. 2. Fiscal year.

All dollar figures are the most recent fiscal year available. \*1990 fiscal year. \*Government budget. \*1991 fiscal year. \*Governmental activities. \*Does not include foreign subsidiaries or entities and activities.

# Faces

**T**he retirement of standard systems throughout Timber Industries is corporate executive director of IS Claus Holmann's main objective. The 46-year-old focuses his attention on this pursuit because he knows it will simplify customer-to-customer processes. He says he plans to "tune up for the 21st century via standardization." Simplification provides a background for organization, and Holmann knows this will create a solid organization.



Claus Holmann  
Timber Industries, Germany



Dianne Lyles  
Weyerhaeuser Co., USA

**S**IXTEEN YEARS of front line experience with IT business initiatives gives Weyerhaeuser Timber lands geographic IS project director Dianne Lyles a generous supply of IS insight. Among other things, she is instrumental in implementing the company's Resource Management System, designed to manage timber harvesting while protecting habitat.

"As a manager within the IT community, I try to continually remind myself that advising the customer not to further automate is a viable business recommendation," she says.

## TALK ABOUT successful re-engineering.

Lucis, the new client/server network at Royal Dutch PET Telecom, has cut order processing time in half, the company says.



José Carlos  
Martínez Sabate  
VAB, Barcelona, Spain

**A**S IS AND TELECOMMUNICATIONS general superintendent at Varig Brazilian Airlines, José Carlos Martínez Sabate dreams of a self-service system where passengers handle their own reservations, payments and tickets, just like a bank automated teller machine. His combination of IS and telecommunications skills makes him an ideal candidate to implement such a system. So does his international experience. At 42 years old, he has held positions in both France and Spain.

| Year<br>founded | # employees | IS spending<br>\$-thousand |
|-----------------|-------------|----------------------------|
| 91              | 100         | \$11                       |
| 971             | NA          | NA                         |
| 940             | 500-999     | \$100-\$249                |
| NA              | 475         | \$25                       |
| 958             | 250-499     | \$5-\$9                    |
| \$1,500         | 2,500-4,999 | \$500-\$1,000              |
| \$2,087         | 1,000-2,499 | \$300-\$499                |
| \$022           | NA          | NA                         |
| NA              | 200         | \$21                       |
| \$1,270         | 1,000-2,499 | \$35                       |
| \$260           | 100-249     | \$25-\$49                  |
| \$288           | 500-999     | \$100-\$249                |
| \$000           | 4,000       | \$200                      |
| 90              | 420         | \$45                       |
| \$045           | 250         | \$45                       |
| \$106           | 1,000-2,499 | \$250-\$499                |
| \$2,200         | 1,000-2,499 | \$250-\$499                |
| 90              | 420         | \$50                       |
| \$012           | 1,000-2,499 | \$100-\$249                |
| \$137           | 500-999     | \$100-\$249                |
| \$210           | 1,000-2,499 | \$250-\$499                |
| \$206           | 1,000-2,499 | \$500-\$1,000              |

# The Global

**O**F THE 18 INDUSTRIES in the Global 100, banking has the best representation, with 16 entries. This is no surprise, given the global reach and heavy IS reliance that characterize many of these world-class institutions.

Transportation follows with 13 entries, automotive with 10 and government with 8. Together, these industries represent nearly half of the companies in the Global 100. Page numbers refer to the first page of the article(s) in which the company appears.



|                                                                          |                |                                        |                |                                               |                |
|--------------------------------------------------------------------------|----------------|----------------------------------------|----------------|-----------------------------------------------|----------------|
| <b>Appliances and Electronics/<br/>Electrical/Photographic Equipment</b> |                | <b>Consumer Products &amp; Apparel</b> |                | <b>The Tata Iron &amp; Steel Co. Ltd.</b>     |                |
| AGFA Gevaert NV                                                          | 54             | Handatan Lever Ltd                     | 58             | <b>Mining and Other Process Manufacturers</b> |                |
| Arcelik AS                                                               | 54             | Kan Corp.                              | 7, 14, 51, 59  | Genex SA                                      | 58             |
| Fisher and Paykel Ltd.                                                   | 48, 58         | Nike, Inc.                             | 14, 58         | Vale Do Rio Doce, Companhia                   | 58             |
| Samsung Electronics Co. Ltd.                                             | 58             | <b>Financial Services</b>              |                | Weyerhaeuser Co.                              | 58             |
| Xerox Corp.                                                              | 52             | The Charles Schwab Corp.               | 54             | <b>Oil &amp; Gas</b>                          |                |
| <b>Automotive</b>                                                        |                | Chicago Mercantile Exchange            | 58             | British Petroleum Co. PLC                     | 58             |
| BMW                                                                      | 54             | Fidelity Investments                   | 58             | Petrobras Brasileiro SA                       | 58             |
| Fiat S.p.A.                                                              | 58             | Merrill Lynch & Co., Inc.              | 58             | PETROBRAS                                     | 48, 58         |
| Ford Motor Co.                                                           | 7, 14, 58      | The Nomura Securities Co. Ltd.         | 58             | Phillips Petroleum Co.                        | 7, 14, 58      |
| Hyundai Corp.                                                            | 58             | Toronto Stock Exchange                 | 52             | TransCanada Pipelines Ltd.                    | 52             |
| Subaru Scania AB                                                         | 58             | <b>Food &amp; Beverage</b>             |                | <b>Pharmaceuticals</b>                        |                |
| Sevel Argentina SA                                                       | 58             | B&W PLC                                | 7, 58          | Eli Lilly and Co.                             | 54             |
| Skoda automobilna AS                                                     | 58             | The Coca-Cola Co.                      | 58             | Glaxo Holdings PLC                            | 14, 35, 48, 58 |
| Tata Engineering & Locomotive Co. Ltd.                                   | 58             | <b>Government</b>                      |                | <b>Recreational Services</b>                  |                |
| Toyota Motor Corp.                                                       | 14, 18, 52, 58 | Information and                        |                | The Royal Hong Kong Jockey Club               | 58             |
| Volvo AB                                                                 | 52             | Decision Support Center                | 22, 54         | <b>Retail</b>                                 |                |
| <b>Banking</b>                                                           |                | Japan Finance Corporation              |                | Coles Myer Ltd.                               | 48, 58         |
| Arab National Bank                                                       | 54             | for Small Business                     | 23, 27, 58     | Jusco Co. Ltd.                                | 58             |
| Australia and New Zealand                                                | 54             | Metropolitan Toronto Police            | 22, 58         | Sanyo Ltd.                                    | 58             |
| Banking Group                                                            | 54             | Michigan Dept. of Social Services      | 22, 58         | Seven Eleven Japan Co. Ltd.                   | 58             |
| Banco Ambrosiano Veneto S.p.A.                                           | 54             | National Computer Board                | 24, 58         | Wald Mart Stores, Inc.                        | 52             |
| Banco Bradesco SA                                                        | 48, 54         | National Information Centre            |                | <b>Transportation</b>                         |                |
| Banco Exterior de Espana                                                 | 54             | New Zealand Inland                     | 23, 54         | AMR Corp.                                     | 54             |
| BankExim                                                                 | 58             | Revenue Department                     |                | Aerospaciale                                  | 54             |
| Barclays Bank PLC                                                        | 14, 54         | Washington State                       | 24, 58         | Amesdale                                      | 54             |
| Bank of China                                                            | 14, 58         | Dept. of Information Services          | 24, 58         | CSX Corp.                                     | 7, 58          |
| The Chaikichi Kangyo Bank Ltd.                                           | 22, 58         | <b>Industrial Equipment</b>            |                | Deutsche Lufthansa AG                         | 58             |
| Deutsche Bank AG                                                         | 14, 25, 44, 58 | ABB Asea Brown Boveri Ltd.             | 14, 25, 44, 54 | Emirates Airlines                             | 7, 58          |
| First National Bank Holdings Ltd.                                        | 48, 58         | Kvaerner Engineering AS                | 28, 58         | Qantas Airways Ltd.                           | 48, 58         |
| Groupo Paribas                                                           | 58             | Mitsumi Corp.                          | 27, 58         | Rolls Royce PLC (Aerospace Group)             | 58             |
| The Kwongnam Bank Ltd.                                                   | 7, 58          | NSK Ltd.                               | 14, 22, 58     | Ryder Systems, Inc.                           | 58             |
| Privatbank, Commercial Bank                                              | 2, 58          | <b>Insurance</b>                       |                | Scandinavian Airlines System                  | 58             |
| Santibonito Group                                                        | 52             | CNP ASSURANCES SA                      | 58             | Swissair                                      | 36, 58         |
| Wells Fargo & Co.                                                        | 14, 58         | United Health Care Corp.               | 58             | United Parcel Service, Inc.                   | 14, 38, 58     |
| <b>Communications</b>                                                    |                | Winterthur Schweizerische              | 58             | VARIG Brazilian Airlines SA                   | 48, 58         |
| Deutsche Bundespost Telekom                                              | 34, 44, 58     | Versicherung-Gesellschaft              | 58             | <b>Utilities</b>                              |                |
| MCI Communications Corp.                                                 | 14, 58         | <b>Metals</b>                          |                | ENEL S.p.A.                                   | 58             |
| Nippon Telegraph and Telephone Corp.                                     | 48, 58         | The Broken Hill Proprietary Co. Ltd.   | 58             | PG&E Energy Co.                               | 58             |
| Royal Dutch/PTT Telecom NV                                               | 34, 58         | COOELCO Chile                          |                | Tokyo Electric Power Co., Inc.                | 22, 58         |
| Singapore Network Services                                               | 58             | Division Chuquibambilla                | 7, 58          |                                               |                |
| Telecom Australia                                                        | 58             | Pohang Iron and Steel Co. Ltd.         | 58             |                                               |                |
| Telecom Italia S.p.A.                                                    | 34, 58         |                                        |                |                                               |                |

# TANDEM MEANS

■ Let's admit it. Decision support is a fancy way to say some very common sense things. Such as:

Knowing your business better.

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Learning more about your customers.

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OUR MASSIVELY PARALLEL SERVERS  
RECORDS—WE EXPLODED THEM. AND

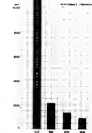
WE'VE JUST BREAK WORLD PERFORMANCE  
CHALLENGE THE INDUSTRY TO BEAT OUR SCORES.

■ To everyone who's excited about parallel processing these days...welcome to an information technology that Tandem has been developing for 20 years.

And what's the cause of all this excitement? Well, 1994 benchmarks—the largest industry standards in history—prove

indisputably that Tandem makes the most powerful, cost-effective parallel software and servers on earth.

In an independently audited TPC-C benchmark, a Tandem Himalaya K10000 open server achieved 20,918 transactions per minute (tpmC) at a price/performance of



"Tandem Blows Everyone Away,"  
Dataquest, June 1, 1994

US\$1,532/tpmC. As you can see from the chart, that's more than seven times greater than the best number of any other vendor.

Thus, in the interest of friendly competition and greater service to all customers, Tandem issues the following challenge: "If, before July, 1995, any vendor using any SQL relational database on any hardware platform can demonstrate higher than 20,918 tpmC at a better price/performance than that shown by Tandem's Himalaya K10000 parallel server TPC-C benchmark, Tandem will donate twice that tpmC figure—US\$41,836—to the charity of that vendor's choice."

Many industry analysts think our record will go unbeaten for a long time—but not, we hope, unchallenged. Any takers? Ladies and gentlemen, start your servers.

# TANDEM MEANS

**TANDEM**

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## Computer Careers

### STRATUS/DEC PROFESSIONALS

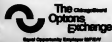
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## Computer Careers

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# Marketplace

## POISED FOR PENTIUM

Priced aggressively, Pentium machines declined an average of \$325 in the first quarter of 1995

By Lynn Haber

With the impending release of Microsoft Corp.'s Windows 95, the PC upgrade cycle to Pentium processors will likely shift into high gear this year. And if you're as for a little shopping, there's no time like the present to buy.

At the end of last year, the 60- and 66-MHz Intel Corp. Pentiums were the entry-level desktop devices, but the 75-MHz Pentium is now the hot processor of choice at about \$2,000. In the last quarter alone, 75-MHz Pentium PC prices declined by \$200, says Jennifer Munson, PC analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

By year's end, 75-MHz Pentiums are expected to be a bargain as 120-MHz processors come out in volume. Then, the 90-MHz Pentium, which costs about \$275 more than a 75-MHz machine on average, will sport an even lower price.

In fact, Dell's is expected to see a 25% price drop in Pentiums over the course of the year, says John Murphy, editor of "PC Price Index" at Metro Computing in Cherry Hill, N.J.

### New direction

Not only will 1995 be the year of the Pentium, but PC users will notice the market switch to the Peripheral Component Interconnect bus, quad-speed CD-ROM drives and monitors of 15 inches and up. And 5M bytes of RAM and a minimum 540M-byte hard drive will be the norm.

On average, Pentium prices declined \$325 in the first quarter of 1995, according to Munson, and additional price drops are expected in June and early in the fourth quarter, when sales tradition-

ally become more aggressive.

But PC vendors will compete on more than hardware issues alone. Compaq Computer Corp., for example, is attempting to differentiate itself with asset management, fault management and security management features, all of which will be dependent on Windows 95.

Other leading vendors are expected to do the same. "Corporations are interested in the total cost of ownership, not simply price," says Richard Zweirichbaum, director of PC research at International Data Corp. in Framingham, Mass.

Several vendors have refreshed their Pentium lines with 75-MHz, 90-MHz and 100-MHz products. Compaq announced new DeskPro and ProLinos models; Digital Equipment Corp. unveiled new Celebris machines; Hewlett-Packard Co. announced a new Vectra VL3 series and new Vectra VE models; and NEC Technologies, Inc. added to its Image series.

Particularly good buys include machines from HP and Dell Computer Corp., which are pricing products aggressively. Dell, which says 44% of its first-quarter revenue came from Pentium sales, Munson says, is also focusing more on its server business, a must-have for serious cost-conscious in the commercial market. "PC vendors without a server product will be left without a defense when trying to sell to larger companies," Zweirichbaum says.

Gateway 2000, Inc., for example, offers very competitively priced Pentiums but has no server product. "It's the missing link for Gateway," Zweirichbaum says.

If you're looking at a Pentium machine from Zenith Data Systems, the compa-

### At a glance:

#### 75 MHz

| Vendor                  | Series            | RAM* | Hard drive* | Monitor | Price   | March   |
|-------------------------|-------------------|------|-------------|---------|---------|---------|
| AST Research, Inc.      | Storm MS-1 5/75   | 8    | 540         | No      | \$1,000 | \$1,940 |
|                         | Storm MS 5/75     | 8    | 540         | No      | \$2,495 | \$2,290 |
| Compaq Computer Corp.   | ProLinos 575 MS   | 11   | 720         | No      | —       | \$1,675 |
|                         | ProLinos 575 MS   | 16   | 720         | No      | —       | \$2,770 |
| Dell Computer Corp.     | Dimension 195 575 | 8    | 540         | 15-in.  | \$2,040 | \$1,690 |
|                         | OptiPlex 765/75   | 8    | 540         | 14-in.  | —       | \$2,157 |
| Digital Equipment Corp. | Celebris 575      | 8    | 540         | No      | \$2,440 | \$2,440 |
| Gateway 2000 Ltd.       | PS-75             | 8    | 540         | 17-in.  | \$2,234 | \$2,234 |
| Hewlett-Packard Co.     | Vectra VL3 5/75   | 8    | 540         | No      | —       | \$1,922 |
| NEC Technologies, Inc.  | Performer 775     | 8    | 540         | No      | —       | \$1,720 |

#### 90 MHz

| Vendor                  | Series            | RAM* | Hard drive* | Monitor | Price   | March   |
|-------------------------|-------------------|------|-------------|---------|---------|---------|
| AST Research, Inc.      | Storm MS/90       | 8    | 540         | No      | \$2,280 | \$2,280 |
| Compaq Computer Corp.   | ProLinos 590      | 16   | 720         | No      | —       | \$3,475 |
|                         | ProLinos 590      | 16   | 720         | No      | —       | \$2,890 |
| Dell Computer Corp.     | OptiPlex 767/90   | 8    | 540         | 14-in.  | \$2,325 | \$2,325 |
|                         | Dimension 195 P90 | 8    | 1,000       | 17-in.  | \$3,350 | \$3,353 |
| Digital Equipment Corp. | Celebris II 900   | 8    | 540         | No      | —       | \$3,340 |
|                         | Celebris II 900 D | 16   | 1,000       | No      | —       | \$4,360 |
| Gateway 2000 Ltd.       | PS-90             | 16   | 1,000       | 15-in.  | \$2,880 | \$2,880 |
| Hewlett-Packard Co.     | Vectra VL3 9/90   | 11   | 840         | No      | —       | \$3,357 |
| NEC Technologies, Inc.  | Image 900         | 16   | 540         | No      | \$3,050 | \$2,967 |
|                         | Image P90         | 8    | 1,000       | No      | \$2,640 | \$2,570 |

#### 100 MHz

| Vendor                  | Series                    | RAM* | Hard drive* | Monitor | Price   | March   |
|-------------------------|---------------------------|------|-------------|---------|---------|---------|
| AST Research, Inc.      | Storm MS 5/100            | 16   | 1,000       | No      | \$3,290 | \$3,219 |
|                         | Advantage Advantage 6200P | 16   | 1,700       | No      | \$2,790 | \$2,440 |
| Compaq Computer Corp.   | ProLinos 5100 MS          | 16   | 720         | No      | —       | \$3,500 |
|                         | ProLinos 5100 MS          | 16   | 720         | No      | —       | \$3,300 |
| Dell Computer Corp.     | OptiPlex 764 100          | 8    | 1,000       | 14-in.  | —       | \$3,861 |
| Digital Equipment Corp. | Celebris II 5100          | 16   | 1,000       | No      | —       | \$4,790 |
| Gateway 2000 Ltd.       | PS-100                    | 16   | 1,000       | 15-in.  | \$2,980 | \$2,980 |
| Hewlett-Packard Co.     | Vectra VL3 5/100          | 8    | 840         | No      | —       | \$2,492 |
| NEC Technologies, Inc.  | Image P100E               | 16   | 1,000       | No      | —       | \$4,073 |

\* Amount of RAM, hard drive size in megabytes.

Source: WorkGroup Technologies, Inc., Hampton, N.H.

ny's products are priced on the high side, Munson says, but that may be because the company is restructuring.

Finally, Packard-Bell Electronics, Inc., the king of retail, is reportedly courting corporate resellers in an effort to carve

out an even larger slice of the PC market. It's too early to tell if the firm has what it takes to play in the big leagues, but its Pentium machines may be worth a look.

Haber is a freelance writer in Boston.

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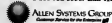
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## MVS territory

CONTINUED FROM COVER 1

about the reliability of Unix-based client/server systems. As a result, they are asking their software providers to deliver MVS-based client/server applications.

"I think there are a lot of people with MVS systems that are looking at it as an avenue to run client/server applications without having to switch everything," said Ken Wymore, vice president of MIS and telecommunications at Western Resources, Inc., a utility in Topeka, Kan.

Wymore said he intends to check out an MVS-based set of client/server applications introduced last week by Walker Information Systems, Inc.

Walker is not the only software providers listening to its customers. Consider their other activities on the client/server horizon last week.

■ SAP America, Inc. Chief Executive Officer Klaus Buefer considered that his company is evaluating moving R/3—the hot-

test selling client/server applications suite—to the IBM mainframe operating system.

■ An Oracle Corp. spokeswoman said that when the company ships its full-blown client/server applications later this year, it will provide MVS support in addition to Unix.

■ Dun & Bradstreet Software officials said they are evaluating an MVS port for the SmartStream suite, mainly because some customers have requested it.

Meanwhile, PeopleSoft Corp., which has offered a mainframe version of its client/server application for years, said about 25% of its newly 700 customers run its human resources software under MVS.

The initial client/server battle cry was to get off the mainframe and go to Unix platforms, which were expected to be cheaper. But many were faced to find big cost savings so they turned to other options such as squeezing more mileage out of mainframe platforms.

"Most [vendors] had been stabilizing

their mainframe products and introducing new products for client/server," said Jeff Comport, an analyst at Gartner Group, Inc. in Stamford, Conn. "But large organizations who still needed mainframe-oriented processing were often at a loss, as few client/server vendors could scale to their high-end demands," he said.

Exact cost benefits of MVS-based client/server applications, however, are still not clear. Most application vendors could not provide potential pricing for MVS versions of their software.

Walker, however, will charge about \$200,000 per MVS-based client/server application module. This is at least double what some client/server modules would cost for a Unix platform. That sounds like bad news, but the MVS module would not require a new operating system and new staffers to manage it, users pointed out.

Jack Cooper, vice president of information management at Bristol-Meyers



Jack Cooper of Bristol-Meyers Squibb said the concept of MVS-based client/server applications has an appeal.

Squibb Co. in New York, said the concept of MVS-based client/server applications "has an appeal." Bristol-Meyers supports a three-tiered architecture that includes mainframes, servers and PCs.

"There is a strong amount of resource advantage when you have an infrastructure in place," Cooper said.

But the bottom line for users is the additional option that MVS-based applications would give them.

For example, Fred Meyer, Inc., a \$3 billion retailer in Portland, Ore., runs various Unix-based client/server systems in its stores, but it is also considering the Walker Tamaris OS software for its corporate headquarters, which now runs host-based Babel applications.

The plan is to run Tamaris OS on the IBM System/360 Parallel Enterprise Server.

IBM's parallel technology "has faster throughput at a lower cost, and it's a much more reliable, available platform," said Ron McVoy, a senior vice president at Fred Meyer. "So, we improve availability, and users can do [tasks such as] decision support at a lower cost. It moves us to a true client/server world."

## Vaporware tactics

CONTINUED FROM COVER 1

available within one year.

Perhaps even more sinking about the survey was the revelation that fully 77% of those polled do not want the federal government involved in regulating vendors' early announcements of products and technologies.

"[Regulation] would be absolutely frightening [because] the federal government has already royally screwed up the information superhighway through regulation and threat of regulation," said Duran Davidson, vice president of Interim Management Consulting, Inc., an international management consulting firm in San Francisco.

"I think the government is in enough things already," said Rick Joyce, director of IS at the Professional Golfers' Association of America in Palm Beach Gardens, Fla. Because vaporware announcements will be vendors in the long run, he added, they are likely to police themselves.

In mid-February, Judge Sporkin refused to enter a consent decree that Microsoft signed last summer with the U.S. Department of Justice in its antitrust investigation of the Redmond, Wash., company's business practices.

Sporkin criticized the decree because it did not address allegations by competitors that Microsoft uses so-called "vaporware" announcements to pre-empt or "freeze" sales of competitors' products.

Indeed, some 74% of users surveyed identified Microsoft as the most aggressive preannouncement in the bunch. The No. 2 vendor identified as most aggressive

was IBM with 29%, and then Novell, Inc. with 29%.

Perhaps ironically, 70% of the IS managers surveyed said they especially need preannouncement information from Microsoft, while only 30% said they need preannouncement information from competitors IBM or Novell, including the WordPerfect division.

If a vendor such as Microsoft provides information on an important system

at AlliedSignal Technical Services Corp. in Columbia, Md. "We don't rely on [pre-announcements] 100%, but they are one component at that's looked at for planning purposes, he added.

## Depends on your point of view

On the vendor side, preannouncements are a more complex issue than simply providing planning information for users, said Mike Conte, group manager at Microsoft's Personal Systems division, which is responsible for Windows 95.

"It's incredibly difficult not to pre-announce software because [news of it] leaks out," Conte said. "The reason that we talked about Windows 95 [in early] in that we have so many partners that we needed to get involved, [including] hardware and software vendors and users, in order to get their feedback."

"It's very hard to do that unless we give a date, and if we didn't set a date, they'd make one up," he added.

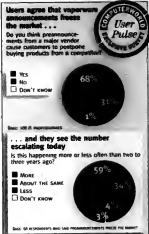
Some industry observers have argued that, because of its desktop dominance, Microsoft should be held to a higher standard than other vendors. But that view was not shared by a majority of the IS managers surveyed. A whopping 73% disagreed with that assertion.

While an overwhelming number of the IS managers said they believe that preannouncements can freeze the market for competitors' products (see chart), they were split almost evenly on whether Microsoft was more aggressive than

other vendors in this arena.

"I don't know if they're more aggressive than competitors [in using preannouncements to freeze the market], but [Microsoft has] certainly used that tactic in the past and so has IBM," said Mike James, supervisor of software at the Illinois Farm Bureau, a nonprofit farmers' association in Bloomington, Ill.

Senior writer Lisa Piccirilli contributed to this report.



## We want it now

One company in the Computerworld survey was the fastest planning horizon that corporate IS managers said they require. More than half said they need to know about important product features and functions only three to six months in advance of their release, and another 30% said they need less than a year.

"I really only need to know three to six months in advance, but it might be nice to have a little longer window," said Brian Comen, manager of the Information Center at JDS, Worldwide Express in Redwood City, Calif.

Only 7% said they need more than a year to plan.

"Anything that's going to be [delivered] over a year is a certainty [because] we budget on a yearly basis, so we try to look out a year ahead," said Mike James, supervisor of software at the Illinois Farm Bureau.

# Needed: a new client/server metric

**R**ecent studies have concluded that client/server fails to deliver on its promises, costs more than expected and that end-user productivity, one of its chief goals, fails to materialize. It took somebody to bring the wrong metric.

Horsemanship was carried over as a measure of power for the internal combustion engine, even though horses had little to do with plugging pistons. But legacy system measures, such as MIPS consumed, reports generated and transactions executed, don't transfer so easily to the world of client/server.

Client/server is sometimes judged a failure because it doesn't deliver results as good as those of mainframe systems. But if the desired results are achieved, they need an entirely different yardstick. Many of them are qualitative as much as quantitative and reflect improved, less error-prone business processes.

We have all experienced the boost in productivity provided by the stand-alone PC; now, everyone expects the same gain to materialize for the group. Those inflated expectations don't take into account that the client/server development team started out with an easy goal of hardware platforms, user interfaces, LANs and incompatible old solutions.

Even if a few departments adopted homogeneous environments, the corporate data being clamored for is on a variety of mainframe systems. Accessing it will require teaching end users several new things in time, and chances are good that the business processes to which they are accustomed should be revised at the same time.

So why move to client/server? Because the desktop clients already exist, with end users in the seats ready to work. Initiatively, administrators and IS staffers know there is a payoff down the road if the desktop can be harnessed to the wider organization, but what isn't known is when the payoff will show up.

One case where this was not an issue is Mer-

cryn's department stores. The company recently moved to a distributed system that included a Sequent Symmetry 730 server at Mercyn's Hayward, Calif., headquarters—without cost/justifying the expense. Technology Director Mary McCormick said she was given the go-ahead because management was confident the move would pay off for the 286-486 chain.

The new system linked the stores together, gave them a common database management system from which they could decipher sales patterns, and reduced a stream of dissimilar reports to just six on which the chain could base many of its business decisions.

These changes, set in motion by the distributed system, represented new ways of doing business. "I don't know how to capture those numbers," McCormick said of quantifying the results. But management had

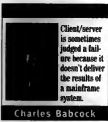
agreed that all the things being done were likely to maintain the chain's competitive edge.

In the more typical case, management needs to be informed that client/server will lead to higher systems costs, add to training expenses and decrease productivity initially. This is a very tough sell. Those who adopt this stance run the risk of not being around when the benefits of client/server finally start to roll in.

So the real difficulty of implementing client/server is finding new metrics that can capture the benefits of revised processes, greater end-user intelligence, faster innovations and better responsiveness to change. The things most difficult to quantify should be in the equation, but they are likely to remain invisible for a year or two as the organization adjusts. IS must seek ways to identify them, using both the knowledge of technology and the business to generate better client/server measures.

Until that effort yields a new metric, the client/server-supporting CEO should pay for a CEO or CFO who understands.

Babcock is Computerworld's technical editor. His MCJ Mail address is 575-2737.



Charles Babcock

## Inside Lines

### Wanted: one ethics evangelist for Microsoft

Judge the U.S. Appeals Court in Washington seems to agree with antitrust experts that federal Judge Stanley Sporkin was "off the reservation" when he ditched the government's 1984 antitrust settlement with Microsoft. But Judge Lawrence Silberman hinted that Sporkin was within his rights to suggest that Microsoft hire a "compliance officer" to ensure the settlement is carried out religiously. Microsoft's legal hounds, Kirkland (University), tartly objected to the "appointment of some kind of official czar who could come free to rehabilitate the company." Toughie, toughie!

### Lotus acquisition rumors abound

So who's buying Lotus this week? In the face of Lotus' first loss in the company's history, the acquisition rumors are heating up. Wall Street was about last week about a former Lotus executive, David Runk, emerging as vice president of acquisitions at Oracle. And Novell Chairman Robert Frankenburg last week denied rumors that Novell would buy Lotus. Lotus says it's not on the block.

### All the network news that fits

A standard is in the works that promises an easier way for information content providers to quickly market their wares on the Internet and via other electronic channels. A group of publishers, information distributors and technology vendors this week will announce the protocol—called the Open Content Publisher Standard (OCPS)—at a conference in New York. The OCPS committee can be reached at [ocps@individual.com](mailto:ocps@individual.com).

### Phone home for a small fortune

One early IBM user is finding the technology costs a lot more than the price of a phone call. For instance, one IS manager at a large Northeastern utility finds that his company is effectively paying for Bell Atlantic to deploy IBM technology. End users not located in IBM-compatible areas end up paying charges for whatever it costs Bell Atlantic to run a trunk line to its central switching office. And if the RBOC needs to upgrade a switching station, "they charge us for that, too," the IS manager gripes.

### Admiring the enemy

Michael Dell, a guest of a company chairman if ever there was one (and proof of it, too), was spotted in rural IDA PC Co.'s headquarters. Somewhat openly praising IBM's technology, Dell was examining IBM's Serial Stage Architecture (SSA), a new RAID technology that can hit speeds of up to 80M b/sec. While a number of vendors say they will support IDA, Dell is the only other hardware maker committed to using SSA in its RAID configurations.

### HP and Compaq snuggling up

Whispers of a joint effort between Compaq and Hewlett-Packard were floating in the air at last week's Comdex show in Atlanta. The two companies are reported to be working on a joint I/O bus standard for PC server products, according to an HP source. The data transfer capabilities of the I/O bus has often been cited as the single biggest bottleneck in PC server architectures.

### OK, who's got the PC remote?

So who needs Dremel when you can play movies and watch movie videos on your PC? Digital video is expected to be the next hot wave in electronics, and there's plenty of friction being generated by its competing camps, Sony/Philips and Toshiba/TiVo/Warner. The Sony/Philips camp scored big last week, leading three drive markets: Minisum, TEAC and Ritek. Sources say PC makers Compaq and Hewlett-Packard are also close to signing with Sony/Philips.

Mark Aug. 24 on your calendar. That's when Microsoft will hold software developers they can expect delivery of Windows 95. Chairman Bill Gates' happy engineers are holding independent software vendors that they are on track to finish the product in June, in time for August shipment. Stay tuned, and stay in touch with Computerworld about news items or tips, call our 24-hour voice-mail tip line at (800) 890-5655 or our toll-free number at (800) 343-6474. Send Editor Margaret Johnson can be reached by phone at (800) 820-8179 or via the Internet at [mjohnson@cw.com](mailto:mjohnson@cw.com).

## How to contact Computerworld editors:

Main office, Franklin, Mass.

24-hour tip line

McAfee: Boston, Rochelle Park, N.J.

Washington bureau, Washington

McIntire bureau, Des Moines, Ia.

West Coast bureau, Broomfield, Calif.

Northeast bureau, Boston

### Phone:

(603) 879-9700

(603) 820-5555

(603) 587-0000

(603) 347-0130

(603) 827-9433

(603) 347-4831

(603) 347-7777

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